

JOHN ERICSSON.

[To accompany bill H. R. No. 148.]

JANUARY 27, 1846.

Mr. T. BUTLER KING, from the Committee on Naval Affairs, made the following

REPORT:

The Committee on Naval Affairs, to whom was referred the memorial of John Ericsson, report as follows :

Some time previous to the year 1841, Captain Robert F. Stockton, of the navy of the United States, was engaged in inquiries respecting the practicability of constructing steam vessels of war, with machinery and propeller beneath the water line, and out of reach of the enemy's shot. In pursuing these inquiries, Captain Stockton consulted the memorialist, whose reputation as an eminently skillful and highly ingenious mechanical engineer has been familiar, for the last twenty years, to all persons, on both sides of the Atlantic, conversant with the progress of mechanical invention. The memorialist, who then resided in England, was employed by Captain Stockton to plan and superintend the construction of an iron boat, with submerged wheels, and an engine similar in its general arrangements to that of the Princeton. The boat and the engine were intended to serve as models for the construction of a ship-of-war, and were sent to the United States for that purpose.

The memorialist came to the United States in the year 1839. It was not till some time in the year 1841, however, that the construction of a steam ship of war upon the above plan was determined upon by government, when Captain Stockton was ordered, upon his own application, to superintend the building of the ship. By arrangements between Captain Stockton and the memorialist, the latter furnished the draughts and plan for the ship and machinery ; and the engine, with its heating apparatus, sliding chimney, and other appurtenances, the propeller and steering apparatus, the gun carriages and self-acting gun locks, and other mechanical contrivances about the ship, were, as it appears by the testimony of the contractors for the machinery, constructed wholly from the draughts, and under the direction of the memorialist, to whom the contractors and other artisans were referred by Captain Stockton for instructions, and the memorialist was constantly occupied in these labors for about two years.

The invention of the propeller applied to the Princeton is disputed, though it is conceded that it was first successfully applied by the memorialist ; and it is also conceded that all the other machinery of the ship now known as the Princeton, is the original contrivance of the memorialist, and

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according to the testimony of all competent persons who have examined that vessel, it is marked by extraordinary fertility of invention, ingenuity, and originality, and, as far as yet tested, great efficiency. The memorialist, therefore, is entitled to the sole credit of whatever valuable new properties the ship may be found to possess, with the exception of certain novel features of her armament, to the merit of which he lays no claim.

As to the work itself, if in any aspect it may be material for the memorialist to show that it was executed to the entire satisfaction of government, it would be only necessary to refer to Executive document No. 121, of the House of Representatives, 28th Congress, 1st Session, hereunto annexed, and marked schedule M, as furnishing the memorialist with a conclusive certificate to that effect. True it is that the name of the memorialist is not mentioned in that document, but it is, nevertheless, admitted that he has actually accomplished the results therein so favorably set forth. This omission of his name is the more remarkable, from the fact that it would appear, from the letter of Captain Stockton to the Secretary of the Navy, with date of May 20, 1844—annexed, and marked B B—that it was in his contemplation to remunerate the memorialist solely by the fame of his labors. One can hardly imagine a more proper occasion for acknowledging the “services of Captain Ericsson’s mechanical skill,” than that of presenting to the government a detailed report of the results they had accomplished in carrying out the “well-intended efforts” of Captain Stockton for the “benefit of the country.” If the memorialist had received the credit of these labors, he might have willingly compromised, to some extent, the amount of his compensation, or, if he had received reasonable compensation, he might well have dispensed with a portion of the credit; but to be denied pay on the ground, substantially, that he did the work for the reputation which he expected to derive from it, and to find his name withheld, though no doubt unintentionally, both from the Navy Department and from Congress, involves contradictions which cannot be reconciled in any wise with the just interests of the memorialist, and the undesigned tendency of which is to deprive him of both pay and reputation.

The work, then, has been done, and is admitted by the government’s own agent to have been well done, and is endorsed with the implied approbation of the President himself, in an official communication to Congress. His employers have substantially certified that the ship in question is the “fastest, cheapest, and most certain ship of war in the world;” and that it is the result of the genius and labor of the memorialist, is not, in any quarter, disputed. There is, thus far, no obvious reason why the memorialist should not be paid a reasonable sum for his services. He appears, however, to have received no compensation whatever, except the sum of \$1,150, advanced to him, during the progress of the work, by Captain Stockton, and which, not entering into the official accounts, remains as a matter of personal adjustment between the parties, of which it is not necessary for the committee to take notice. But the claim of the memorialist, for the services above mentioned, presented to the Navy Department in March, 1844, was disallowed for reasons set forth in a letter from the Secretary of the Navy to the memorialist, dated May 11, 1844, (schedule F, annexed,) and in a letter to a member of the Committee on Naval Affairs of the last Congress, hereto annexed, and marked A A; although the bills of the contractors, and other artisans, who constructed the machinery from the draughts and under the direction of the memorialist, have been allowed and paid, upon the certificate

of Captain Stockton, approved by the commandant of the navy yard at Philadelphia, where the Princeton was built.

It will be observed that the Secretary of the Navy bases his refusal to allow the claim of the memorialist, entirely upon the statement of Captain Stockton, as given at large in his letter of May 20th, to which the committee have already referred (B B). In all cases where an individual devotes his time and labor to the service of another, or of the government, the legal presumption is, that a pecuniary reward is contemplated, both by the employer and the person employed. Upon this principle, the memorialist is clearly entitled to compensation, unless sufficient reasons can be found, in the evidence of Captain Stockton, as detailed in that letter, for withholding it.

The material allegation of the letter is, that the memorialist was permitted, at his own solicitation, and with a distinct understanding that his services were to be gratuitous, to introduce his inventions on board the Princeton, as a test of their value and as a means of recommending them to general use.

Although some advantage might thus be expected to accrue to the memorialist, it is hardly probable that he would have been disposed to devote so great a length of time to the service of government, for the sake of an experimental test of the value of inventions, which, in general, are applicable only to an armed marine, and, of course, not likely to be extensively patronized; and which, therefore, have not been secured by patent. It may be added, with regard to the propeller itself, that it had ceased to be considered experimental long before the building of the Princeton. But, without dwelling on these considerations, the committee find, in the accompanying letters from Captain Stockton to the memorialist, abundant proof of the original employment of the latter by that officer; and of an explicit understanding between them that the memorialist was to be compensated by the government, both for his services and the use of his inventions.

The Navy Department does not appear to have been apprized, by Captain Stockton, that the memorialist had been employed by him; but there is no evidence that the memorialist was aware of this circumstance; on the contrary, he had a right to suppose, and probably did suppose, from Captain Stockton's undated letter, (hereto annexed, and marked No. 12,) that his employment and expectation were made known to the government. For proof of the employment of the memorialist by Captain Stockton, and the understanding of *both* in respect to compensation, the committee refer, generally, to the letters above alluded to, and hereto annexed, marked, respectively, 12 to 27; but they consider the letter marked No. 12, which, though undated, obviously appears to have been written before the construction of the ship was commenced, and which expressly mentions compensation for the use of patents, and the letter dated February 2, 1844, (marked No. 26,) desiring a receipt for moneys paid by Captain Stockton, for "services rendered in constructing and superintending machinery of the United States ship Princeton," as conclusively proving that that officer encouraged the memorialist to expect from government a remuneration, both for his personal services and the use of his inventions.

It is proper here to notice that the memorialist alleges that he replied to Captain Stockton's undated communication (marked No. 12) by a letter, in accordance with the suggestions of Captain Stockton's, dated July 28, 1841, a copy of which (marked No. 13) is hereunto annexed. There is no proof,

but the allegation of the memorialist, that such reply was forwarded ; but in the absence of all complaint from Captain Stockton of a neglect to reply, and the want of evidence that a different answer was written, the committee incline to believe the answer sufficiently proved.

The committee therefore consider these facts as established—that Captain Stockton had sufficient authority from the government to employ the memorialist in its service, and to bind the government to compensate him, both for his time and the use of his inventions ; that, in pursuance of such authority, he did employ the memorialist, upon an understanding that he was to be reasonably paid for his labors, in superintendence, and the exercise of his mechanical ingenuity ; and that the memorialist, thus employed, has devoted much time to the concerns of the government, and rendered it valuable services, in the just and well-founded expectation of a reasonable reward.

The committee are unable to discover any distinction in principle, between the case of the memorialist and that of the founders, machinists, and other artisans, employed in constructing the Princeton, by the same agent and under the same authority ; and they submit that he is entitled to remuneration on every principle of equity and every rule of law.

The extreme hardship of the case of the memorialist has been augmented by circumstances which have occurred since the presentation of his memorial, proof of which has been before the committee. They deem it, therefore, very material to add, that the memorialist has been subjected to great expense, and to a great sacrifice of time and labor, in defending, in the circuit court of the United States for the southern district of New York, a suit brought therein, in April term, 1844, by Mr. Francis P. Smith, of London, on behalf of the company formed in Great Britain for the introduction of the Archimedean screw in steam navigation. The plaintiff alleges that the memorialist has invaded rights, secured to him by letters patent, in the construction of the Princeton and Legaré, armed vessels in the public service of the United States, and claims to recover of him the sum of \$5,000 actual damages, to be trebled in the discretion of the court. In contemplation of the company to which the committee have above referred, the exclusive privilege of locating a screw propeller in the dead-wood of a ship, whether of the mercantile marine or the naval service, belongs to Mr. Francis P. Smith, of London ; and it is this claim which the memorialist, in consequence of his connexion with the armed ships in question, has been compelled to contest in an expensive and vexatious litigation. It is to be observed that the peculiar arrangement of the propelling apparatus which induces the controversy in question, has never been employed by the memorialist in commercial vessels, and that the right to employ it in our armed marine is rather a matter of public concern than of any private interest to the memorialist.

On the trial of the cause it was ruled, however, by Mr. Justice Nelson, who presided on the occasion, that, if the application of the propeller in the Princeton was an invasion of the plaintiff's right, the memorialist was liable to answer for it in damages ; although it fully appeared that the employment of the memorialist had not been officially recognised or remunerated. The *infringement* not having been proved to the satisfaction of the jury, they failed to agree upon a verdict, and the suit is still in the course of active prosecution by the plaintiff.

It appears in proof that the expenses of the litigation have been exclusively borne by the memorialist, and that no other party employed in build-

ing or fitting out the Princeton has been prosecuted for his agency therein, and that the memorialist has received no assistance whatever in the conduct or in the expenses of the said suit, from the government of the United States, from the officer under whose superintendence the Princeton was built, or from the contractors or manufacturers of the said steam machinery, or the naval constructors; but that the whole burden of the same has been thrown on the memorialist, and has been sustained at his unaided individual expense. Whether or not there is any design in the selection of the memorialist as the subject of attack by this foreign company, with the view of embarrassing the introduction of his inventions in our naval service, or for any other cause, it is not material to inquire; but the committee deem it not improper to add, in this connexion, that, though Mr. F. P. Smith obtained his letters patent in England in 1836, and has employed his invention advantageously in the British navy and under the patronage of the lords of the admiralty, he has never yet introduced it into the United States, whilst the memorialist appears to have come to this country in 1839 with reference to this particular object, and to have been occupied exclusively, during a large portion of the time that has since elapsed, in demonstrating the superiority of this mode of propulsion for the purposes of naval warfare, by his own unrecognised and, hitherto, unremunerated labors.

It would seem obvious that, if the memorialist is called upon to bear the burden of his connexion with the Princeton, he is entitled to enjoy the credit of its construction, and a reasonable compensation for his labors.

With regard to the amount of compensation claimed, the committee have been satisfied, by abundant testimony on behalf of the memorialist and of the United States, that the sum of \$15,080, claimed by the memorialist, is but a moderate remuneration for his services as engineer in planning and in constructing the machinery and armament of the United States war steamer Princeton, and this even without reference to the length of time during which he has remained unrewarded, or the great expenses to which he has been subjected by the litigation to which they have referred. It is sufficient to say that the charges comprehend the planning and superintending the construction of a double semi-cylindrical steam-engine, on an entirely new plan; a submerged propeller; boilers; sliding chimney, with a mechanism for raising and depressing the same; centrifugal blowers, and engines for working the same; a heating apparatus for retaining the caloric usually lost in blowing off at sea, and employing the heat of the waste steam from the engines for heating the feed-water before entering the boilers; rudder and frame of steering apparatus; wrought-iron carriages and friction gear for the large guns; carronade carriages; self-acting gun-locks; spirit level for the large guns; geometrical stair-case, and other arrangements connected with the engine room; constructing the general plan of the ship, and ship's lines below water; together with office expenses, postages, stationery, carriers' charges, and travelling expenses necessary in the superintendence of the said work at Philadelphia, New York, and Sandy Hook, and other expenses incurred during the period that the memorialist was exclusively devoted to the service of the United States. To pay the amount which thus appears to be justly due to the memorialist, the committee report the accompanying bill.

Memorial of John Ericsson, of the city of New York, civil engineer, addressed to the Congress of the United States, praying for compensation of his services, as engineer, in planning and superintending the construction of the steam machinery and propeller of the United States steamer Princeton, and for other services specified in the accounts annexed.

To the honorable the Congress of the United States :

The memorial of John Ericsson, of the city of New York, civil engineer, respectfully sheweth : that on the fourteenth day of March ultimo he addressed to the honorable the Secretary of the Navy a communication transmitting an account, in duplicate, for services rendered as engineer in planning and superintending the construction of the steam machinery of the United States steamer Princeton, and for certain inventions therein specified. A copy of the said communication and account is hereunto annexed, and marked schedule A.

To this communication your memorialist had the honor to receive from the honorable the Secretary of the Navy *ad interim* a letter informing him that the said communication had been referred to Captain Robert F. Stockton for his report, a copy of which letter is annexed, marked schedule B.

Receiving no further reply from the department, your memorialist, under date of April 8th, had the honor to address a letter to the honorable the Secretary of the Navy, referring to the communication of the 14th March, and soliciting his early attention to the same. A copy of this letter is annexed, marked schedule C.

This letter having remained unnoticed for a month, your memorialist had the honor to address another letter, under date of the 8th instant, to the honorable the Secretary of the Navy, a copy of which is hereunto annexed, and marked schedule D.

To this letter your memorialist, on the 13th instant, had the honor to receive replies, under the dates respectively of May 10th and May 11th, copies of which are hereunto annexed, marked E and F.

By the last letter your memorialist is informed, in effect, that he is to receive no compensation from the department for the services he has rendered, and which are enumerated in the accounts which your memorialist had the honor to submit to the department under date of the 14th March. Under these circumstances, your memorialist is compelled to appeal to Congress for the compensation thus denied by the department.

It will be perceived, from the letter to which your memorialist has last alluded, that it is suggested by Captain Stockton that your memorialist has no "legal claim" upon the department. By this expression, Captain Stockton does not intend to deny that the services alleged have been rendered ; that the work for which your memorialist claims compensation has been done by him, and well done ; nor that the United States are in the present enjoyment of the unpaid results of your memorialist's labor and invention.

The annexed affidavits of Merrick and Towne, of Philadelphia, and of Hogg and Delamater, of New York, marked respectively G and H, are submitted in verification of the account originally rendered to the department.

A claim founded on such considerations, and so verified, your memorialist cannot well distinguish from a "legal claim."

From the confidence which your memorialist entertained in the success of his inventions, he had no hesitation in entering into an arrangement with Captain Stockton, that the patent fees for the propeller and steam engine of the Princeton should be left entirely to himself or the department. As early as July, 1841, your memorialist received a letter from Captain Stockton requesting from him a letter giving his views on the subject of the use of his *patent rights*. "As a great effort has been made," wrote Captain Stockton at that time, "to get a ship built for the experiment, I think you had better say to me in your letter that your charge will hereafter be (if the experiment should prove successful) ———; but as this is the first trial on so large a scale, I am at liberty to use the patents, and, after the ship is tried, the government may pay for their use in that ship whatever sum they may deem proper."

To that letter, your memorialist replied in the manner that Captain Stockton requested, using, with regard to the "*patent right*" for the ship propeller and semi cylindrical steam engine, the following language: "I beg to state that whenever the efficiency of the intended machinery of your steam frigate shall have been duly tested, I shall be satisfied with whatever sum *you may please to recommend, or the government see fit to pay, for the PATENT RIGHT.*" This your memorialist presumes to be the agreement which Captain Stockton alleges to be "directly violated" by the account which your memorialist has submitted to the department. It is true that your memorialist consented thus to leave the amount of his *patent* fees to what Captain Stockton should "recommend," or the government see fit to pay. Six months have elapsed since the ship was tried. Four months have elapsed since Captain Stockton reported to your honorable body that the Princeton "can make greater speed than any sea-going steamer or other vessel heretofore built," and expressed his belief that she would prove "invincible" against any foe. Meanwhile, the government has not seen fit to pay your memorialist any thing for his patent rights. Meanwhile, Captain Stockton has not been pleased to recommend that any thing should be paid to your memorialist for his patent rights. And when your memorialist calls upon the department, *not* for the patent fees in question, but for the bare repayment of his expenditures, and compensation for his time and labor in the service of the United States—still leaving his patent charges to their own voluntary action—he is told that the "government cannot allow his claim," and the presentation of his bill, "if it is to be considered a legal claim upon the department," "violates an agreement."

This agreement, it is obvious, had reference *only* to the patent rights in question, and not to the services of your memorialist as engineer, his expenses in that capacity, nor to his compensation for the numerous inventions and improvements unconnected with the engine and propeller which were subsequently introduced in the *Princeton*. Your memorialist never contemplated that these services should be gratuitously rendered, and it would require, certainly, a very clear and unequivocal expression of such an intent on his part to lead any one to a conclusion so extraordinary.

Under these circumstances, your memorialist is compelled to apply to your honorable body for relief, and would respectfully solicit the attention of your honorable body to the verified accounts he has the honor to transmit to them. The advances which your memorialist has made on account

of the United States, and the great length of time during which he was devoted to this work without compensation, have exhausted his resources; and the refusal of the department to entertain his claim leaves him no recourse but that of making a direct appeal to the representatives of the American people.

All which is most respectfully submitted by your obedient servant,
JOHN ERICSSON.

SCHEDULE A.

CITY OF NEW YORK, *March 14, 1844.*

SIR: I have the honor to transmit to you, annexed, the bill for my services as engineer in planning and superintending the construction of the steam machinery, armament, &c., of the U. S. steamer Princeton, and for certain inventions therein specified.

I beg leave to state that the per diem charge, of five pounds sterling, includes all my office, travelling, and other professional disbursements, and barely covers my expenses for the time during which I have been occupied on this important national work.

Of the value of the inventions which I have introduced in the Princeton, the results of much previous labor and outlay, it does not become me to speak. On this subject I can only refer to the recent official report of Captain Stockton, and to the report made by the American Institute of New York, at Captain Stockton's request, a copy of which is herewith enclosed. In any point of view, I trust that my professional charges will be deemed reasonable by the department, for it has been my intention to make them so. When the sum total of charges is compared with the magnitude of the work that has been performed, it will exhibit a moderate compensation for services of such variety and extent.

I have the honor to be your most obedient servant,
JOHN ERICSSON.

The Hon. the SECRETARY OF THE NAVY.

NEW YORK, *March 13, 1844.*

U. S. NAVY DEPARTMENT,

To JOHN ERICSSON, *Civil Engineer*, DR.

For planning and superintending the construction of the machinery, armament, &c., &c., of the United States war steamer Princeton, viz: planning and superintending the construction of a double semi-cylindrical steam-engine on an entirely new plan; a submerged propeller; boilers; sliding chimney, with a mechanism for raising and depressing the same; centrifugal blowers and engines for working the same; a heating apparatus for returning the caloric usually lost in blowing off at sea, and employing the heat of the waste steam from the engines for heating the feed water before entering the boilers; rudder and frame of steering apparatus; wrought iron carriages and friction gear for the large guns; carronade carriages; self-acting gun locks; spirit level for the large gun; geometrical staircase, and other arrangements connected with the engine room; constructing the gen-

eral plan of ship and ship's lines below water ; also for time occupied in travelling, and travelling expenses in superintending said work at Philadelphia, New York, and Sandy Hook ; office expenses ; postage ; carrier's charges ; cab hire ; letters of instruction to the manufacturers, &c., &c., viz :

Planning the semi-cylindrical steam engine and submerged propeller.

SPECIFICATION OF DRAWINGS.

Piston shafts, crank levers, and pins, scale $1\frac{1}{2}$ inch to the foot :
 Crank shaft, main crank and pin, propeller shaft and clutch boxes, scale ditto :
 Larboard semi-cylinder, end plates, covers, centre pieces and guide rings, scale ditto :
 Larboard connecting rod complete, scale 3 inches to the foot :
 Quadrant, double and single crank levers, and axes of reversing motion, scale ditto :
 Axes and cranks of slide movement, scale ditto :
 Pillow blocks for supporting said axes, full size :
 Vibrating piston, with metallic packings and springs, scale 3 inches to the foot :
 Side view and transverse section of pillow blocks for piston shaft, half size :
 Top view of ditto, same scale :
 Side view and half sectional plan of main pillow block, half size :
 Half front and half back view, two end views, and plan of main engine frame, scale $1\frac{1}{2}$ inch to the foot :
 Pillow blocks for supporting axes of reversing gear, full size :
 Forked connecting rod for reversing motion, full size :
 Eccentrics, eccentric rods and stops, scale 3 inches to the foot :
 Links for slide gear, with slide and brasses, full size :
 Regular slide, cut off slide, double slide cases, starting valve, and guide for slide movement, scale 3 inches to the foot :
 Air pump bucket, valves, piston-rod, pump-head, &c., full size :
 Side elevation and plan of air pump, scale 3 inches to the foot :
 Coupling link for air-pump rod, containing three joints, full size :
 Connecting rod for giving parallel motion to ditto, full size :
 Half front view, half back view, two end views, and plan of back frame of engine, scale $1\frac{1}{2}$ inch to the foot :
 Bracket for supporting centres of parallel motion, with double pillow blocks, of universal adjustment, full size :
 Condenser, valve-box, foot-valve and door, scale $1\frac{1}{2}$ inch to the foot :
 Delivery valve of air-pump, full size :
 Stuffing boxes for piston shaft, full size :
 Coupling links of reversing gear, full size :
 Reversing screw, with handle, guides, and index, full size :
 Bracket for supporting reversing spindle, full size :
 Bracket with double pillow-blocks for supporting the axes of slide motions, full size :
 Plunger of force pump, with connecting rod, full size :

Double crank lever, with pins for moving air-pumps and force-pumps, full size :

Improved Kingston valve for injection and blowing off, full size :

Force-pump, hot well and air vessel, 3 inch scale :

Injection valve for condenser, full size :

Hand-gear for moving, starting, and injection valves, with pillow-blocks and indexes, full size :

Forward stern pillow block for supporting propeller-shaft, 3 inch scale :

Aft stern pillow block, same scale :

Plan and side elevation of engine kelsons, scale one-half inch to the foot :

General plan of engine room, showing steam connexions, boilers, blowers, heater, water pipes, &c., &c., scale one-half inch to the foot :

End view, foreshortened view, and front view of spiral plates of propeller, $1\frac{1}{2}$ inch scale :

Vertical section and front view of spiral spokes, hub, and hoop of propeller, $1\frac{1}{2}$ inch scale :

Transverse section through the centre line of spiral plates, full size :

General plan representing the longitudinal section and end view of semi cylinders, piston shafts, crank levers, main crank and shaft, slide-spindles, centre lines and slide movements, &c., &c., scale $1\frac{1}{2}$ inch to the foot :

The above forty-four drawings, with the various sketches, skeleton plans, and diagrams necessary in their construction, occupied 135 days, which, at the rate of £5 a day, amounts to £675; being, at \$4 80 exchange - - - - - \$3,240

For planning the boilers, sliding chimney and mechanism, centrifugal blowers, and engines and heating apparatus.

SPECIFICATION OF DRAWINGS.

End views of the three boilers, and transverse and longitudinal section of boilers, 1 inch scale :

Sectional plan of centre and wing boiler, 1 inch scale :

Section of sliding chimney, 1 inch scale :

Two plans of mechanism for raising and depressing chimney, full size :

Blow-off and stop-valves for boilers, full size :

Five doors, full size :

Ash pit doors, full size :

Air chamber placed under boilers for receiving and distributing blast from the blowers :

Dampers, with gear for regulating the blast, full size :

General plan of steam pipes, safety valves, steam stop valves, &c. &c., $1\frac{1}{2}$ inch scale :

Valve boxes, safety valves, and steam stop valves, full size :

Two plans of braces with straps and keys for securing boilers, full size :

Float, with levers, spindle, stuffing box, and index, to show the height of water in boilers, full size:

Heating apparatus for supplying boilers with hot water, $1\frac{1}{2}$ inch scale:

Slide valve and mechanism connected with heating apparatus, 3 inch scale:

Side elevation, plan, &c., of small steam engine for working blowers, 3 inch scale:

Detailed plan of connecting rod and other working parts of said engine, full size:

Conical steam valve for ditto, full size:

Fan wheel, axes, and pulley, for blower, 3 inch scale:

Eccentric cases and bearings for ditto, 3 inch scale:

Tightening pulley with gear for regulating the tension of the bolt of blower, full size:

The above twenty four drawings occupied forty six days in planning and constructing, which, at £5 per diem, amounts to £230; being, at \$4 80 to the pound - - - \$1,104

For planning ship, general arrangement of engines, rudder, &c., &c.

SPECIFICATION OF DRAWINGS.

Longitudinal and transverse sections of ship, side elevation of propeller and steam-machinery, and section of semi cylindrical engine, $\frac{1}{4}$ inch scale:

Plan of construction showing the ship's horizontal water lines and vertical sections below water line, $\frac{1}{4}$ inch scale:

Rudder constructed on a new plan, frame composed of wrought iron and brass filled in with wood, sides of copper plate, 1 inch scale:

Rudder post of wrought iron and copper secured by composition shoes top and bottom, 1 inch scale:

Frame of steering apparatus, 3 inch scale:

Longitudinal section of the after part of the ship, with the side elevation of boilers, engines, propeller, shaft, main crank, &c., $\frac{1}{2}$ inch scale:

Stern bearing for supporting outer end of the propeller shaft, stuffing box, and copper pipe inserted in the dead-wood of the ship, $1\frac{1}{2}$ inch scale:

Circular railway for supporting small wrought iron gun, and top view of bed for supporting gun carriage, $\frac{1}{4}$ inch scale:

Railway and centre piece of bow-gun, $1\frac{1}{2}$ inch scale:

Cast iron geometrical staircase for engine room and cabin, plan of detail 3 inch scale, general plan 1 inch scale:

Side elevation of ship's stern, showing rudder post, and stern post and frame, bolted to the ship's keel, 1 inch scale:

The above eleven drawings, with the various sketches, skeleton plans, and diagrams necessary in their construction, occupied 54 days, which, at £5 a day, £270, amounts, at \$4 80 exchange, to \$1,296

Planning wrought iron gun carriages, friction gear, revolving beds, gunlocks, &c., &c.

SPECIFICATION OF DRAWINGS.

Side elevation, top view, and two end views, with centre ring and bolt, of revolving bed for 12-inch guns, $1\frac{1}{2}$ inch scale :

Side elevation, end views, and plan of wrought iron carriage for 12 inch English wrought gun, $1\frac{1}{2}$ inch scale :

Side elevation and end view of wrought iron carriage for 12 inch cast iron gun, $1\frac{1}{2}$ inch scale :

Amended plan of wrought iron carriage for 12 inch American wrought iron gun :

Truck wheels, bearing brasses, and mechanism, for rolling gun in and out port hole, full size :

Adjusting screw and mechanism for elevating and depressing 12 inch guns, full size :

Friction gear of carriage for cast iron 12 inch guns, full size :

Friction gear for 12 inch English wrought iron gun, part full size, part $1\frac{1}{2}$ inch scale :

Transverse section and top view of friction beams and centre bolt of bed for American wrought 12 inch gun, and top view of friction gear for ditto, $1\frac{1}{2}$ inch scale, and also full size drawing of friction gear for the same :

Friction loop and friction beams of cast iron 12 inch gun, full size :

Forceps and lifter for handling 12 inch balls, full size :

Plan of a new spirit level for ascertaining the elevation of guns with great accuracy, full size :

Side elevation, vertical section, with a detached view, of trunnion band and trunnions of American 12 inch wrought iron gun, $1\frac{1}{2}$ inch scale :

Vertical section of after part of breech of said gun, with breech pin and pummelion, full size :

Eight full size working drawings of casing and mechanism of self-acting gun lock :

Side elevation, top view, and end view, of carronade carriage, with its mechanism in detail, 3 inch scale :

Detail plan of wood work of ditto, 3 inch scale :

Full size drawing of friction gear of ditto :

The above twenty-five drawings occupied seventy-two days, being, at £5 a day, £360, and exchange at \$4 80 - \$1,728

For superintending the building and construction of the whole of the machinery, the plan and drawings of which are herein above enumerated, viz :

AT NEW YORK.

The propeller, boiler, &c., blowing engines, bed and friction gear of American 12 inch gun, and boring and finishing the same ; hooping of English wrought gun, and manufacturing self-acting gun locks and spirit level.

AT PHILADELPHIA.

The semi cylindrical steam engine; heating apparatus, rudder, &c.; steering apparatus; beds, friction gear, and wrought iron carriages of English wrought guns and cast iron 12 inch gun; and various other parts appertaining to the steam machinery.

AT SANDY HOOK.

Fixing and adjusting beds, friction gear and carriages, gun locks, spirit level, &c., hooping English wrought gun, and attending gun practice.

For superintending the fixing and application of the whole of the above enumerated steam machinery and other contrivances to the U. S. steamer Princeton; and attending trials of steam machinery; also, correspondence and letters of instruction to manufacturers, &c., connected with the above named work:

These services occupied 81 days, which, at £5 a day, amount to £405, and at \$4 80 exchange, to - - - - - \$1,944

Time occupied in travelling between New York and Philadelphia, and New York and Sandy Hook, in superintendence and application of the above work, &c., &c., thirty-two days, at £5 a day, £160, amounting, at \$4 80 exchange, to - - - - - 768

(The above charge of £5 sterling per day includes office expenses, stationery, instruments, postages, carrier's charges, cab-hire, and travelling expenses of every description.)

For services rendered in inventing, designing, and perfecting the following improvements connected with the arts of naval warfare and with steam-ships of war, and applied to the U. S. steamer Princeton, viz:

The heating apparatus, by which a great saving of fuel is effected which has never before been attained:

The new gun carriage, by which not only the heaviest piece of ordnance can be handled by a few men, but which so gradually checks the recoil that the ship receives no injurious shock:

The sliding chimney and mechanism by which that great desideratum, the absence of a projecting chimney in a ship of war, has been attained: and

The spirit level, by which the elevation of a piece of ordnance may be readily ascertained with the utmost precision - - - - - 5,000

\$15,080

SCHEDULE B.

NAVY DEPARTMENT, March 16, 1844.

SIR: I have received your letter of the 14th instant, with an account, in duplicate, for compensation for inventing and superintending the machinery, &c., of the U. S. ship Princeton.

The account has been referred to Captain Stockton for a report, and when that is furnished an answer will be given to your application.

I am, very respectfully, yours,

L. WARRINGTON,

Secretary of the Navy ad interim.

Capt. J. ERICSSON, *New York.*

SCHEDULE C.

NEW YORK, April 8, 1844.

SIR : I had the honor to receive from the honorable the Secretary of the Navy ad interim, under date of the 16th ultimo, a letter acknowledging the receipt of my account, transmitted in duplicate, for services rendered as engineer in planning and superintending the construction of the steam machinery of the United States steamer Princeton, and for certain inventions therein specified.

You will pardon me for renewing my application on this subject. The great length of time which I devoted to this work compelled me to incur pecuniary liabilities which render it necessary for me to solicit as early an attention to my account as may be consistent with the multiplicity of business which, I am well aware, must at this moment press upon the department.

I have the honor to be, sir, your most obedient servant,

J. ERICSSON.

The Hon. J. Y. MASON,

Secretary of the Navy.

SCHEDULE D.

NEW YORK, May 8, 1844.

SIR : On the 8th ultimo I had the honor to address a communication to the department, calling attention to my account, transmitted on the 16th March to the honorable the Secretary of the Navy ad interim, for my services as engineer in planning and superintending the steam machinery, &c. of the United States steamer Princeton, and for certain inventions therein specified.

As a month has now elapsed, and I have received no acknowledgment of the receipt of the latter communication, I am apprehensive that the absence of an express appropriation may make it necessary for me to apply by petition to Congress. I respectfully solicit, therefore, from the department, such information as may enable me to judge of the propriety or necessity of making such an application.

I have the honor to be, sir, your most obedient servant,

J. ERICSSON.

The Hon. JOHN Y. MASON,

Secretary of the Navy.

SCHEDULE E.

NAVY DEPARTMENT, *May 10, 1844.*

SIR: Your letter of the 5th instant is received. The subject of your claim for compensation has been referred to Captain Stockton, and the department is awaiting his report. When received, you shall be informed of its decision.

I am respectfully yours,

J. Y. MASON.

Capt. J. ERICSSON, *New York.*

SCHEDULE F.

NAVY DEPARTMENT, *May 11, 1844.*

SIR: A letter has this day been received from Captain Stockton, which contains the following paragraph in relation to your claim:

"In regard to Captain Ericsson's bill, which was sent to me at the same time, I must say that, with all my desire to serve him, I cannot approve his bill: it is in direct violation of our agreement, as far as it is to be considered a legal claim upon the department."

With such an unfavorable expression of opinion, the department cannot allow your claim.

I am respectfully yours,

J. Y. MASON.

Capt. J. ERICSSON, *New York.*

SCHEDULE G.

UNITED STATES OF AMERICA, }
Eastern district of Pennsylvania, } ss.

Samuel V. Merrick and John Henry Towne, of the city of Philadelphia, in the district aforesaid, civil engineers and engine manufacturers, being duly sworn, each for himself doth depose and say as follows, to wit: that they were employed by the Navy Department of the United States to construct the steam machinery and gun carriages, geometrical staircases, frame of steering apparatus, rudder, rudder post, &c., for the United States steamer Princeton, under the direction of Captain Robert F. Stockton. And these deponents further say, that the said steam machinery and gun carriages were built from the drawings hereinafter enumerated, designed and furnished to them by Captain Ericsson of the city of New York, civil engineer, and that the whole of said work was commenced and completed according to said plans, and in obedience to the instructions, oral and in writing, furnished to them by the said Captain Ericsson, to whom they were referred by Captain Stockton for the drawings and instructions for the said steam machinery and gun carriages. And these deponents further say, that the said work was commenced in the month of January, in the year 1842, when they received the first of the said drawings made by the

said Captain Ericsson, and was completed in the month of November, or thereabouts, in the year 1843 ; and that during the whole period intermediate the said dates the said Captain Ericsson gave instructions orally and by letter, and furnished the drawings of each and every part of the said steam machinery, and gun carriages, &c., and was occupied when in Philadelphia in the superintendence of the said work. And these deponents further say, that the said Captain Ericsson furnished the plans showing how the said machinery was to be applied to the said ship, and directed the manner of fixing the same on board. And these deponents further say, that the following is a correct list of the drawings for the said work executed and furnished by the said Ericsson, and now in the possession of these deponents, at their works in Philadelphia, in the district aforesaid :

Piston shafts, crank levers and pins, scale $1\frac{1}{2}$ inch to the foot :
 Crank shaft, main crank and pin, propeller shaft and clutch boxes, scale ditto :
 Larboard semi cylinder, end plates, covers, centre piece and guide rings, scale ditto :
 Larboard connecting rod complete, scale 3 inches to the foot :
 Quadrant double and single crank levers and axes of reversing motion, scale ditto :
 Axes and cranks of slide movement, scale ditto :
 Pillow blocks for supporting said axes, full size :
 Vibrating piston with metallic packings and springs, scale 3 inches to the foot :
 Side view and transverse section of pillow blocks for piston shaft, half size :
 Top view of ditto, same scale :
 Side view and half sectional plan of main pillow block, half size :
 Half front and half back view, two end views and plan of main engine frame, scale $1\frac{1}{2}$ inch to the foot :
 Pillow blocks for supporting axes of reversing gear, full size :
 Forked connecting rod for reversing motion, full size :
 Eccentrics, eccentric rods and strops, scale 3 inches to the foot :
 Links for slide gear with slide and brasses, full size :
 Regular slide, cut off slide, double slide cases, starting valve, and guide for slide movement, scale 3 inches to the foot :
 Air pump bucket, valves, piston rod, pump head, &c., full size :
 Side elevation and plan of air pump, scale 3 inches to the foot :
 Coupling link for air pump rod, containing three joints, full size :
 Connecting rod for giving parallel motion to ditto, full size :
 Half front view, half back view, two end views, and plan of back frame of engine, scale $1\frac{1}{2}$ inch to the foot :
 Bracket for supporting centres of parallel motion, with double pillow blocks of universal adjustment, full size :
 Condenser, valve box, foot valve and door, scale $1\frac{1}{2}$ inch to the foot :
 Delivery valve of air pump, full size :
 Stuffing boxes for piston shaft, full size :
 Coupling links of reversing gear, full size :
 Reversing screw with handle, guides and index, full size :
 Bracket for supporting reversing spindle, full size :
 Bracket with double pillow blocks for supporting the axes of slide motions, full size :
 Plunger of force pump with connecting rod, full size :

- Double crank lever with pins for moving air pumps, and force pumps, full size :
- Improved Kingston valve for injection and blowing off, full size :
- Force pump, hot well and air vessel, three inch scale :
- Injection valve for condenser, full size :
- Hand gear for moving, starting and injection valves with pillow blocks and indexes, full size :
- Forward stern pillow block for supporting propeller shaft, three inch scale :
- Aft stern pillow block, same scale :
- Plan and side elevation of engine kelsons, scale $\frac{1}{2}$ inch to the foot :
- General plan of engine room, showing steam connexions, boilers, blowers, heater, water pipes, &c., &c.; scale $\frac{1}{2}$ inch to the foot :
- Heating apparatus for supplying boilers with hot water, $1\frac{1}{2}$ inch scale :
- Slide valve and mechanism connected with heating apparatus, 3 inch scale :
- Rudder constructed on a new plan, frame composed of wrought iron and brass filled in with wood, sides of copper plate, 1 inch scale :
- Rudder post of wrought iron and copper, secured by composition shoes, top and bottom, 1 inch scale :
- Frame of steering apparatus, 3 inch scale :
- Stern bearing for supporting outer end of the propeller shaft, stuffing box, and copper pipe inserted in the dead-wood of the ship, $1\frac{1}{2}$ inch scale :
- Circular railway for supporting small wrought iron gun, and top views of bed for supporting gun carriage, $\frac{1}{4}$ inch scale :
- Railway and centre piece of bow gun, $1\frac{1}{2}$ inch scale :
- Cast-iron geometrical staircase for engine room and cabin, plan of detail 3 inch scale, general plan 1 inch scale.
- Side elevation, top view, and two end views, with centre ring and bolt of revolving bed for 12 inch guns, $1\frac{1}{2}$ inch scale :
- Side elevation, end views, and plan of wrought-iron carriage for 12-inch English wrought gun, $1\frac{1}{2}$ inch scale :
- Side elevation and end view of wrought-iron carriage for 12 inch cast-iron gun, $1\frac{1}{2}$ inch scale :
- Amended plan of wrought iron carriage for 12 inch American wrought iron gun :
- Truck wheels bearing brasses and mechanism for rolling gun in and out port hole, full size :
- Adjusting crew and mechanism for elevating and depressing 12 inch guns, full size :
- Friction gear of carriages for cast-iron 12 inch guns, full size :
- Friction hoop and friction beams of cast-iron 12 inch gun, full size
- S. V. MERRICK,
J. HENRY TOWNE.

Sworn and subscribed on this 10th day of May, A. D. 1844, before me.
GEO. GRISCOM, *Alderman*]

SCHEDULE H.

UNITED STATES OF AMERICA, }
Southern district of New York, } ss.

Peter Hogg and Cornelius Delamater, engineers and engine manufactur-

ers at the Phoenix foundry, at 260 West street, in the city of New York, in the district aforesaid, being duly sworn, each for himself, doth depose and say: that they were engaged in the said establishment, in the employ of James Cunningham, the said Peter Hogg as superintendent, and the said Cornelius Delamater as clerk, when the said James Cunningham was employed by the Navy Department of the United States, under the direction of Captain Robert F. Stockton, in constructing the steam boilers, the propeller, blowing engines and centrifugal blowers, sliding chimneys and the mechanism of the same, of the United States steamer Princeton. And these deponents further say, that the said work was commenced by the said James Cunningham in the month of January, A. D. 1842; and that the said Cunningham, before its completion, sold out his interest in the business of the said Phoenix foundry to these deponents, and that the said work was completed by them for the said Cunningham, and, during its whole progress and manufacture, came under their immediate charge and supervision. And these deponents further say, that the said Cunningham has left the city of New York, and resides in the city of Boston or thereabouts, in the State of Massachusetts. And these deponents further say, that they were themselves employed by the Navy Department of the United States, through Captain Robert F. Stockton, to repair and hoop the English wrought iron gun, to repair the wrought iron gun carriages, to make a new bed and friction gear for American wrought iron gun, to construct the self-acting gun locks, and spirit level for levelling ordnance, and to bore and finish the American wrought iron gun for the said steamer Princeton. And these deponents further say, that the said work was completed in the month of January, in the year 1844, or thereabouts. And these deponents further say, that during the period intermediate the said month of January, 1842, and the said month of January, 1844, the work hereinbefore described was constructed at the said Phoenix foundry under the personal superintendence and instructions of Captain John Ericsson, of the said city of New York, civil engineer, and altogether, in all its details, from plans and drawings furnished and executed by him. And these deponents further say, that the list annexed is a correct enumeration of the said plans and drawings, after which the said machinery hereinbefore described was constructed, and that the same are now in the hands of these deponents at the Phoenix foundry, in the said city of New York:

End view, fore-shortened view, and front view of spiral plates of propeller, $1\frac{1}{2}$ inch scale;

Vertical section and front view of spiral spokes, hub, and hoop of propeller, $1\frac{1}{2}$ inch scale;

Transverse section through the centre line of spiral plates, full size;

End views of the three boilers, and transverse and longitudinal section of boilers, 1 inch scale;

Sectional plan of centre and wing boiler, 1 inch scale;

Section of sliding chimney, 1 inch scale;

Two plans of mechanism for raising and depressing chimney, full size;

Blow-off and stop valves for boilers, full size;

Five doors, full size;

Ash pit doors, full size;

Air chamber placed under boilers, for receiving and distributing blast from the blowers;

Dampers with gear for regulating the blast, full size ;
 General plan of steam pipes, safety-valves, steam stop-valves, &c., &c., $1\frac{1}{2}$ inch scale ;
 Valve boxes, safety-valves, and steam stop-valves, full size ;
 Two plans of braces, with straps and keys for securing boilers, full size ;
 Float, with levers, spindle, stuffing-box, and index, to show the height of water in boilers, full size ;
 Side elevation, plan, &c., of small steam engine for working blowers, 3 inch scale ;
 Detailed plan of connecting rod and other working parts of said engine, full size ;
 Conical steam valve for ditto, full size ;
 Fan wheel, axes and pulley for blower, 3 inch scale ;
 Eccentric cases and bearings for ditto, 3 inch scale ;
 Tightening pulley with gear for regulating the tension of the bolt of blower, full size ;
 Friction gear for 12 inch English wrought iron gun, part full size, part $1\frac{1}{2}$ inch scale
 Transverse section and top view of friction beams and centre bolts of bed for American wrought 12 inch gun, and top view of friction gear for ditto, $1\frac{1}{2}$ inch scale, and also full size drawing of friction gear for the same ;
 Forceps and lifter for handling 12 inch balls, full size ;
 Plan of a new spirit level for ascertaining the elevation of guns with great accuracy, full size ;
 Side elevation, vertical section, with a detached view of trunnion band and trunnions of American 12 inch wrought iron gun, $1\frac{1}{2}$ inch scale ;
 Vertical section of after part of breech of said gun, with breech pin and pummelion, full size ;
 Eight full size working drawings of casing and mechanism of self-acting gun-lock.
 Side elevation, top view, and end view of carronade carriage, with its mechanism in detail, 3 inch scale ;
 Detail plan of wood-work of ditto, 3 inch scale ;
 Full size drawing of friction gear of ditto.

PETER HOGG,
 CORNELIUS DELAMATER.

Subscribed and sworn to before me by C. Delamater and Peter Hogg
 this 14th day of May, 1844.

GEO. W. MORTON,
*Deputy Clerk Circuit Court of the United States
 for the southern district of New York,
 and United States Commissioner.*

[Schedules I, J, and K are additional affidavits, not referred to in the memorial.]

SCHEDULE I.

UNITED STATES OF AMERICA, }
Southern district of New York, } ss.

William A. Cox, of the city of New York, in the district aforesaid, being
 duly sworn, doth depose and say that he is a consulting civil and mechanical

engineer, and is conversant with the construction of mechanical drawings and the getting up plans of machinery of every description, and with the fees and charges commonly made in the engineering profession, and is well acquainted with the professional standing of Captain Ericsson in this country, and, through the foreign scientific journals, with his standing in Europe. And this deponent saith that a per diem charge of five pounds made by Captain Ericsson is a very fair and reasonable charge for such services as are enumerated in said bill, according to the usages of the engineering profession. And this deponent saith that he is acquainted with the construction and arrangement of the four inventions and improvements specified by Captain Ericsson in his said bill, that is to say: firstly, the new gun carriage, which enables a few men to manipulate the heaviest piece of ordnance, and which gradually checks the recoil so as to save the ship from any injurious shock; secondly, the sliding chimney, a contrivance by which the most vulnerable part of a steam ship is rendered comparatively safe from shot; thirdly, the spirit level, by which a piece of ordnance can be aimed with much greater precision than has hitherto been attained, and which, if viewed with reference to its accuracy, and the facility, quickness, and safety with which it can be used, may be said to change entirely the character of gun practice; and, fourthly, the apparatus for heating the water fed to the boilers, which saves a large proportion of fuel, and enables the engineer, when at sea, to "blow off" very freely, and prevent the water from acquiring such a degree of saltness as would injure the material of the boilers and obstruct the passage of the heat. This last invention is of such importance that this deponent has entered into a calculation of its advantages as used in the Princeton, the result of which is, that when one-half of the quantity of water fed to the boilers is blown off, as it should be, for the reasons before stated, the saving in fuel is about twenty-five per cent., and this saving is effected by a diminution of only about two per cent. of the power of the engines—all of which is shown more fully by a diagram appended hereto. And this deponent saith that he considers the said inventions, which he believes to be altogether novel, so valuable and important in their application to the purposes for which they are designed, that the amount charged by the petitioner is much smaller than he would be fairly and justly entitled to receive for the same from the government, and much less than an adequate remuneration for the time, labor, and science expended upon the same by the petitioner.

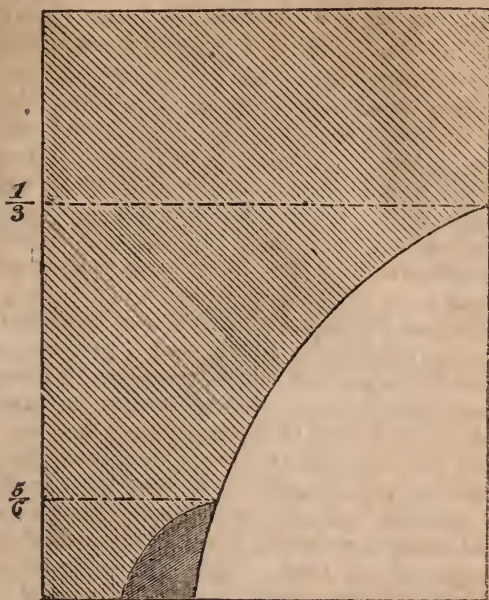
WILLIAM A. COX.

Subscribed and sworn to this 16th day of December, 1844, before me.

GEO. W. MORTON,

Dep. Clerk Circuit Court U. S. and U. S. Commissioner, &c.

Diagram to illustrate a calculation of the saving in fuel effected by the heating apparatus in the U. S. steam ship Princeton, and referred to in the foregoing affidavit.



Steam cut off at $\frac{1}{3}$ of the stroke.

Valve communicating with the heating apparatus begins to open at $\frac{5}{6}$ of the stroke.

One-half of the volume of steam is admitted to the heating apparatus.

The power exerted by the engine is shown comparatively by that part of the diagram shaded with black: it is equal to $\frac{4}{5}$ ths, or 98 per cent. of the whole power of the steam.

Loss of power consequent upon the use of the heating apparatus shown by the part shaded with blue, and equal to $\frac{1}{5}$, or 2 per cent.

Of the water pumped into the boilers, one-half is converted into steam and one-half "blown off."

If the heating apparatus raised the water which enters the boilers to the same temperature as that which is "blown off," the saving in fuel would be $\frac{1}{5}$; but inasmuch as there is a difference of temperature of about 20° Fah., the saving is reduced to $\frac{1}{4}$, very nearly, or about 25 per cent.

Loss, as before shown - - - - - 2 " "

Net gain - - - - - 23 " "

WILLIAM A. COX.

NEW YORK, Dec. 16, 1844.

SCHEDULE J.

UNITED STATES OF AMERICA,
Southern district of New York, } ss.

James J. Mapes, of the city of New York, in the district aforesaid, being duly sworn, doth depose and say, that he has carefully examined the bill rendered to the Navy Department by Captain Ericsson for his services in connexion with the war steamer Princeton, and for the inventions in said bill mentioned. And this deponent further saith, that he is by profession a consulting engineer, and has been long familiar with machinery and mechanical drawings, and is well acquainted with the customary fees and charges of the engineering profession, and with the professional reputation of the petitioner. And this deponent further saith, that soon after the completion of the Princeton this deponent visited said ship as a member of the committee of the American Institute, for the purpose of making an examination and report upon the steam machinery, armament, &c., of said ship, and for this purpose did make a thorough and critical examination of the same, and embodied the results of his observation in the report hereunto annexed, and which this deponent desires to make a part of his affidavit. And this deponent further saith, that the said report presents, in his judgment, a candid and fair statement of the merits of Captain Ericsson as constructor of the engine, steam machinery, and armament of the said Princeton. And this deponent further saith, that a per diem charge of five pounds, exclusive of travelling expenses, would not be a compensating charge for the services enumerated in said bill, as a lifetime is required to prepare for such services, and the employ is not constant. And this deponent further saith, that, in his judgment, there is no other engineer in this country so capable as Captain Ericsson for such service, and that his charges are much less than would have been made by many engineers of less ability. And this deponent further saith, that, in his judgment, the sum of fifteen thousand dollars is a very moderate, if not an altogether inadequate, remuneration for services of such variety and extent as have been rendered by Captain Ericsson in the construction of the said steam-ship Princeton. And this deponent further saith, that the four inventions specified in said bill, and which this deponent believes to be entirely novel inventions, and calculated to insure complete success when opposed to any other known arrangement in naval warfare, are, in deponent's judgment, of such great value and importance in their application to the purposes of the national defence, that their author would be fairly entitled for the said inventions alone to make a charge equal to the total amount of his bill, and that they would be cheaply purchased by the government for that sum.

JAMES J. MAPES.

Subscribed and sworn to by James J. Mapes, before me, this 16th day of December, 1844.

GEO. W. MORTON,
Dep. Clerk Circuit Court U. S. and U. S. Commissioner.

[Report referred to in the foregoing affidavit of James J. Mapes.]

REPORT ON THE STEAM FRIGATE PRINCETON.

The Committee of the American Institute, to whom was referred the examination of the steam frigate Princeton, respectfully report :

That, having met and added to their number several scientific and nautical gentlemen, they proceeded to the Brooklyn navy yard, where the ship had gone to avoid the floating ice of the North river.

The commander of the Princeton was absent, but had left instructions with his first lieutenant, (Mr. Hunt,) his other officers, and the engineers belonging to the ship; through the politeness and attention of whom your committee were enabled to examine all the details of the ship, engine, and armament.

The ship is 164 feet in length, 30 feet beam, 22 feet hold, making her about 700 tons measurement. She draws 17 feet of water aft, and $14\frac{1}{2}$ feet forward. The peculiarity of her construction is great sharpness of entrance and run, with nearly flat floors midships, which effectually prevent her being crank, notwithstanding the great weight of her battery.

The most obvious peculiarity of the Princeton's model is the great extent of her dead-wood, terminating with a stern-post of unusual thickness, being twenty six inches through at the centre of the propeller shaft, but tapering both above and below. The object of this uncommon form is to give sufficient strength to the stern-post, as a hole of thirteen inches diameter passes through it, in which the propeller shaft revolves. The stern-post also requires unusual strength, because the bearing which supports the whole weight of the propeller is attached to it, the shaft having no bearing abaft the propeller. The rudder is of an entirely novel construction, consisting of a frame of wrought iron, filled in with five inch pine plank, the whole of which is cased with copper plates, three-sixteenths of an inch thick, thus making the entire thickness of the rudder five inches and three-eighths. The mode of supporting the rudder is equally novel. It is hung to an outrigger of wrought iron, covered with half inch copper plate, the upper part being attached to a strong oak knee under the counter, and the lower part being attached to a solid frame of oak timber, three feet six inches wide, and fourteen inches deep, firmly bolted to the after part of the keel and dead-wood of the ship. The thickness of the outrigger is five and three-eighths inches, the same with that of the rudder, measuring two feet fore and aft; the forward part being made as sharp as a ploughshare. This sharpness, and the thinness of the rudder, prevent the current produced by the propeller from retarding the progress of the ship.

Your committee examined, with particular interest and attention, the steam engine of the Princeton, which excited their admiration, no less by the novelty of its construction than by the perfect symmetry and beauty of its proportions. It is styled, by the inventor and patentee, (Captain Ericsson,) the "Semi-Cylindrical Steam Engine." It has been constructed, apparently, with two main objects—that of being placed entirely below the water line, and of giving a *direct* motion to the propeller shaft, which requires a greater velocity than can be obtained by the ordinary engine. These objects have been fully accomplished; indeed, so compact is the engine, that its highest point is placed more than four feet below the water

line, and so far below the berth deck that it affords space for lodging from two to three feet of coal above it, as well as on the sides.

The peculiarity of this engine consists in the use of semi-cylinders, instead of entire cylinders. These semi-cylinders are 72 inches in diameter, and eight feet long. The pistons are parallelograms, attached to wrought iron shafts, forming the axis of the semi-cylinders, and are made to vibrate through an arc of 90 degrees, by the admission of steam alternately on opposite sides, ordinary slide valves being employed for that purpose. The piston shafts pass through stuffing boxes at each end of the semi cylinders; and at the forward ends, crank levers of 34 inches throw are attached, which, by means of connecting rods only 74 inches in length, give motion to the main crank of the propeller shaft. The active surface in each piston measures ninety-six inches by twenty-six, presenting an area of two thousand four hundred and ninety-six inches. The centre of pressure of each piston moves through an arc of precisely thirty-six inches, and thus the Princeton's engines have equal power with two ordinary marine engines having cylinders of $56\frac{3}{4}$ inches diameter and three feet stroke.

At the opposite ends of the piston shafts, crank levers of 16 inches throw are attached, for the purpose of giving motion to the air pumps and force pumps. Your committee cannot refrain from noticing particularly the ingenious disposition of the working parts connected with these pumps, and the remarkably simple mode by which the requisite parallel movements are obtained.

The maximum speed of the engines is thirty-seven revolutions per minute. The maximum pressure of steam in the boilers is twenty-five pounds to the square inch; and the steam in the semi-cylinders is invariably cut off at one-third of the stroke. The greatest speed of the vessel, as ascertained by Captain Stockton, in the Delaware, has been nearly fourteen statute miles per hour. At the ordinary speed of twelve miles, the consumption of fuel has been found to be eighteen hundred pounds per hour.

It is necessary only to allude to the propeller of the Princeton, constructed by Capt. Ericsson, and identical with that now so successfully employed in various parts of the country. This propeller is manufactured of composition metal. Its extreme diameter is 14 feet, and the upper part is full 3 feet below the water line.

The boilers of the Princeton are also placed below the water line, and resemble those of the ordinary marine engines; but their furnaces and flues are so constructed as to burn anthracite as well as bituminous coal.

Attached to the boiler is a heating apparatus possessing very remarkable properties, by which the water feeding the boilers is constantly heated before entering the same. Your committee view this apparatus as perhaps the greatest improvement of which the low pressure engine for ship use is susceptible. It not only continually supplies the boiler with hot water, but enables the engineer, when at sea, to "blow off" very freely, without any material loss of pressure or expenditure of fuel.

The smoke pipe of the Princeton is constructed upon the principle of the telescope, and may be elevated in lighting the fires, or when it is desirable to work the engines with natural draught. The contrivance made for this purpose is efficient, being a simple application of the endless screw, turned by a crank; and it enables two men to raise and lower the chimney with great facility, precluding the possibility of an accident from negligence, as the smoke pipe will remain stationary whenever the men at the hoisting

apparatus discontinue working it. The successful introduction of this sliding smoke pipe, and the means for elevating and depressing it, must be considered a complete solution of one of the many problems connected with naval warfare hitherto unsolved.

The fire draught is independent of the height of the smoke pipe, being promoted by centrifugal blowers placed in the bottom of the vessel, and worked by separate small engines. Thus the steam machinery of the Princeton realizes all that can be desired for a war steamer, as the whole of it is placed out of the reach of the enemy's fire.

Your committee would do great injustice to the manufacturers and the vast progress in the mechanic arts, recently made in the United States, if they omitted to refer, in language of the highest pride and gratification, to the beautiful workmanship and execution of the steam machinery of the Princeton. It more than rivals—it surpasses—the machinery of the trans-Atlantic steam ships. It was built by Messrs. Merrick & Towne, of Philadelphia.

The armament of the Princeton consists of twelve forty-two pound carronades, and two two-hundred-and-twelve-pound Stockton guns. These last are made of wrought iron, said to have been thoroughly proved, and all are placed on the upper or spar deck. One of the Stockton guns, weighing fourteen thousand pounds, is placed eight feet forward of the mizen-mast, and in a line with it; the other, weighing twenty-three thousand pounds, is placed at the bow. Both are mounted on carriages traversing on beds of timber, which are secured in the centre by strong pivots, around which they turn. These beds are supported by four friction rollers, inserted in the four corners, and travelling on a flat ring of composition metal let into the deck. The bulwarks, being movable and very light, are readily unshipped, to give full play to the large guns in the direction required.

The carriages are made entirely of wrought iron, each side being composed of two plates, five sixteenths of an inch thick, four and a half inches apart, and connected by a series of stay bolts. In the space between the two plates, a simple mechanism is ingeniously concealed, which enables four men with the utmost facility to roll the guns back and forward on the beds, and removes altogether the anticipated difficulties in managing ordnance of such immense calibre. It need hardly be stated that the difficulty of checking the recoil attending the heavy charge necessary for such a piece is even greater than that of moving the gun, and here again mechanical skill has triumphed to all appearance over the supposed insuperable obstacle. The ordinary breeching is entirely dispensed with, and the recoil is checked by opposing a gradually increasing friction to the carriage on which the gun is mounted. The means employed for this purpose exhibit a happy application of one of the fundamental principles of mechanics—that of the inclined plane, in connexion with the laws of friction; and so successfully has this principle been applied, that although the friction apparatus, at the termination of the recoil of the gun, becomes what is technically called *jammed*, with a force perhaps of many millions of pounds, yet by slightly touching a lever, it becomes instantly disengaged, leaving the gun and carriage perfectly free. A contrivance having the same object in view is applied to the carronades, which in them also dispenses with the ordinary breeching.

In connexion with the Stockton guns, besides the carriage, &c., of which

they have spoken, your committee have to notice two other contrivances, which render them unquestionably the most formidable ordnance ever mounted. Of these, the first is a lock so constructed that it is discharged at any desired elevation, without human interference, by a peculiar mechanism, in which the law of gravitation, in connexion with the rolling of the vessel, is rendered subservient to this purpose. The second contrivance referred to is an instrument to measure distances, by which the requisite elevation to be given to the gun may be instantly determined.

Your committee would mention that the heaviest of the Stockton guns was forged in the city of New York, by Messrs. Ward & Co., and was bored and finished by Messrs. Hogg & Delamater, of the Phoenix foundry. It is composed entirely of American iron, and is, beyond comparison, the most extraordinary forged work ever executed in this or any other country.

The Princeton is sparred and rigged in the ordinary manner of sloops of war. All the modern improvements of our packet ships have been adopted, and in some cases simplified. It is therefore believed that as a sailing ship, without reference to her engines, she will be found to be very fast, and to excel in that respect any thing of her size yet built for our government. This quality will enable her to keep the sea as long as any other corvette, and at no greater expense—her fuel, like her powder, being reserved for an emergency.

The cabins are arranged in a very neat and tasteful manner. Economy of space, perfect cleanliness, and free circulation of air, are combined, by dispensing with the partitions usually forming the state-rooms of the officers. By an arrangement of curtains, drawn out upon rods fixed to the deck beams overhead, the state-rooms are made; they are ranged along each side of the ward room, and when not in use the curtains are run back against the ship's side, effectually exposing the whole apartment to the air. The beds of the officers are upon the principle of sofa bedsteads—folding up and forming a handsome piece of furniture by day; and the wash stand, with which each officer is provided, shuts up, and presents, when not in use, a neat sideboard.

The question whether this arrangement will be popular with the officers, is one not pertinently before your committee; but it is believed that too much attention cannot be paid to their comfort, that they may feel the proper love for their profession, so necessary to the success of our arms, within the circumscribed limits of a ship. The rigid discipline so imperiously demanded, where the lives of all and the honor of the flag are involved, hinges upon the habitual implicit obedience of orders. Any arrangement that may tend to reduce officers to a level with the men they are to command is detrimental, and any that increases the distance between them will unquestionably increase the respect requisite to success.

Among the generals and tacticians of Europe, the belief prevails that our superior discipline has been heretofore the cause of our successes; and the unflinching conduct, unbroken discipline, and calm contempt of danger, which distinguished the crew and officers of the Missouri, burnt recently at Gibraltar, have done more to elevate our national character in this respect than can be possibly computed by any reckoning of cost of property destroyed.

In conclusion, your committee take leave to present the Princeton as every way worthy the highest honors of the Institute. She is a sublime conception, most successfully realized—an effort of genius skilfully exe-

cuted—a grand *unique* combination, honorable to the country as creditable to all engaged upon her. Nothing in the history of mechanics surpasses the inventive genius of Capt. Ericsson, unless it be the moral daring of Capt. Stockton, in the adoption of so many novelties at one time.

The same is respectfully submitted.

J. S. DRAKE,

H. MEIGS,

ADONIRAM CHANDLER,

PH. SCHUYLER,

JAS. RENWICK,

GEO. F. BARNARD,

GURDON J. LEEDS,

THOS. S. CUMMINGS.

GEO. C. DE KAY, *Chairman.*

JAS. J. MAPES, *Secretary.*

SCHEDULE K.

UNITED STATES OF AMERICA, {
Southern district of New York, } ss.

Dionysius Lardner, of the city of New York, in the district aforesaid, being duly sworn, doth depose and say, that he has carefully examined the bill of particulars hereunto annexed, purporting to be the copy of a bill rendered to the Navy Department of the United States government, by John Ericsson, of the city of New York, civil engineer, for professional services in planning and superintending the construction of the steam machinery, &c., of the United States steamer Princeton, and for certain inventions therein specified. And this deponent further saith, that he has been conversant for many years with the habits and usages of the engineering profession, and that for ten years preceding his arrival in this country, that is to say, from the year eighteen hundred and thirty to the year eighteen hundred and forty, he practised as a consulting engineer on an extensive scale in England, and was employed directly or indirectly in almost all the great public works, and in many government investigations; that since his arrival in this country he has continued his professional practice, and has been professionally connected with all the leading English engineers, and with many of those of the United States; and that deponent is conversant with the fees and charges customarily made in the engineering profession. Deponent further saith that he is well acquainted with the professional standing of the petitioner, Captain Ericsson, both in this country and in Europe. And this deponent further saith that during the period of the construction of the Princeton, he had frequent opportunities of inspecting the drawings in the annexed bill specified, and has been generally conversant with them, and that he has also visited the Princeton, and has examined her machinery and armament since the completion of the same. And this deponent further saith that the per diem charge of five pounds, including travelling expenses and other professional disbursements, does not amount to one-half the sum ordinarily allowed in England to an engineer of the same professional standing with the petitioner; and this deponent further saith that the extensive collection of plans and drawings executed and designed by Captain Ericsson, and specified in the said bill of particulars, shows a greater amount of mental labor and more extraordinary resources of mechanical invention than have ever before fallen under de-

ponent's notice in any similar case ; that said drawings are not confined to such as fall within the ordinary routine of professional business, but extend in many instances to contrivances which are the results of original inventive powers, directed to the solution of novel points in mechanics, and that on this account alone their author would, according to the usage of the profession, be entitled to extraordinary compensation. And deponent further saith, that an examination of these drawings, plans, and specifications affords proof that the great advance in the science of steam-navigation applied to national defence, which has been made in the construction of the United States steam-ship Princeton, has been the result of the labors and genius of Captain Ericsson, and that on this account, also, a most liberal compensation is due to him. And this deponent saith, that he has examined the plans and seen the construction of the four inventions and improvements specified by Captain Ericsson in his said bill ; that is to say, the heating apparatus by which an extensive saving of fuel is effected, a matter of paramount importance in a vessel of this class—the new gun carriage, which enables a few men to manipulate the heaviest piece of ordnance, and which gradually checks the recoil so as to save the ship from any injurious shock ; the sliding chimney, a contrivance by which the most valuable part of a steam-ship is rendered inaccessible to shot—and the spirit level, by which a piece of ordnance may be aimed with precision, notwithstanding the motion of the vessel ; and deponent saith that he considers that these four improvements are of so much national importance, that their inventor would be very inadequately rewarded by a compensation so limited as that charged for them in the said bill ; and this deponent saith he believes said inventions to be new, and applied for the first time in the said steam ship Princeton.

And this deponent further saith, that on a general view of the annexed bill, taking the whole together, and considering the perfect success which has attended the operation of the vessel, thus invented and constructed by the petitioner, he does not hesitate to depose that the sum total in the said bill, charged by the petitioner, is, according to the deponent's experience and judgment, a very inadequate compensation for the services and inventions therein enumerated ; and the petitioner might have made a charge of more than double the total amount, without being justly censurable with being extravagant or unreasonable.

DION. LARDNER.

Subscribed and sworn to this 28th day of November, 1844, before me.

GEO. W. MORTON,
U. S. Commissioner.

[The bill annexed to the above affidavits was that contained in the foregoing schedule A.]

SCHEDULE L.

NEW YORK, *December 14, 1844.*

DEAR SIR: I have examined carefully the documents received from you, showing the claim of Capt. Ericsson for compensation for the design and superintendence of the machinery of the Princeton. The usual mode of

providing for the compensation of an engineer in similar cases, so far as my experience has gone, is by a commission on the amount of the cost of the work under his charge. A larger allowance is generally made when the plan is new and untried, and demanding of the chief engineer more attention as to details than when he is only required to follow an old arrangement, merely adapting the proportion to the subject in hand. In the case of Capt. E. there seems to have been vast attention to the most minute particulars of the machinery; and also that he performed personally much labor in preparing *working draughts*, usually made in the office of the machinist and charged to the work. A commission of ten per centum, exclusive of travelling expenses, stationery, &c., would be readily obtained for such services as a matter of agreement. The cost of the machinery of the Princeton is not known to me, but I presume it is less than \$100,000. As I know nothing of the patented improvements, I can say nothing as to the charge of \$5,000 for their use.

I am respectfully yours,
ROBERT SCHUYLER.

SCHEDULE LL.

WASHINGTON, D. C., *January 9, 1846.*

SIR: Your letter of the 8th instant is received.

In reply to the contained request of my opinion "of the propriety of the charge made by Captain J. Ericsson for furnishing the designs and working drawings, and for superintending the construction of the engines, boilers, and propeller of the United States steamer Princeton," I have to say that, referring to the professional value of the services, the charge of £5 per day is a proper one. In this I am strengthened by a knowledge both of the character of the work and of the unusual despatch with which it was performed.

I have the honor to be, very respectfully,

CHAS. H. HASWELL.

Hon. THOS. BUTLER KING, *Washington, D. C.*

SCHEDULE LLL.

UNITED STATES OF AMERICA, }
Southern district of New York, } ss.

Frederick A. Hanford, of said district, resident in the city of New York, attorney at law, being duly sworn, doth depose and say, that he is the attorney of record for the defendant, in a suit commenced at the April term of the circuit court of the United States for the southern district of New York, in the second circuit, in the year 1844, and still pending, wherein Francis Pettit Smith, of the city of London, is plaintiff, and John Ericsson is de-

defendant; and this deponent saith that the plaintiff therein claims to recover of the said defendant the sum of \$5,000 actual damages, to be trebled at the discretion of the court, for the alleged infringement by said defendant of a certain patent of said plaintiff in the construction of the steam ship Princeton and the revenue cutter Legare. And this defendant saith that said cause was brought to trial in the month of July last, and it was proved on said trial that the said defendant was responsible for the construction of the said Princeton; and his honor Mr. Justice Nelson, who presided at the said trial, ruled that the said defendant was liable to the said plaintiff in damages, if the jury should be of opinion that the application of the propeller in the Princeton was an infringement of the said plaintiff's patent. And this deponent further saith, that it was stated by the plaintiff's counsel, on the said trial, that the said invention had been introduced into extensive use in the British navy, and that the admiralty had constructed the Rattler and other frigates on the said plan, and that it was now considered highly advantageous for the construction of ships of war, in consequence of the propelling apparatus and steam machinery being placed below the water line and out of the reach of shot; being thus preferable to the exposed paddle wheels and steam machinery of ordinary steam-ships. And this deponent further says, that it was proved on the said trial, by the testimony of Russell Sturgis, esq., agent for the nominal plaintiff, residing in the city of New York, that the real plaintiff in the said action was a wealthy incorporated company in the city of London, from whom he had a power of attorney to act in the premises, and that the said invention had not been introduced by them in the United States, although their letters patent in England were dated in the year 1836. And this deponent further saith, that the defendant in the said action patented his said propeller employed in the Princeton in the year 1836, in England, and in the United States in the year 1838, and that in the year 1839, as this deponent is informed and believes, he came to this country with the view of permanently remaining here, and of introducing his said improvement in the American waters, and that he has taken the steps necessary to his naturalization as a citizen of the United States. And this deponent further saith, that on the trial of the said cause it fully appeared that the said corporation, plaintiff, had incurred no expenditures in practically demonstrating in this country the advantage or value of the alleged invention, and that the new mode of propulsion adopted in the Princeton was first introduced into the United States by the said defendant, and, in the peculiar application used in the Princeton, and which was the subject matter of the said suit, only in said ship, and with some modifications in the Legare. And this deponent further saith, that the jury on the said trial, after being out for twenty hours, were unable to agree, and were discharged. And this deponent further saith that the said cause is still pending and at issue, and ready for trial at the next term of the United States circuit court for the southern district of New York. And this deponent further saith, that the defence of the said suit has demanded much time and labor of the said defendant during the last eighteen months; that he has incurred heavy expenses in procuring the requisite testimony to sustain his rights, and in the employment of attorney and counsel to defend the same, and in the trial of the said cause; and that the said expenses are still continuing and likely to continue, in consequence of the ample means employed in the prosecution of the said suit and the interest of the said company, plaintiff, to monopolize

the peculiar application of the said propeller adopted in the Princeton. And this deponent further saith that the said expenses have been exclusively borne by the said defendant, and that no other party employed in building or fitting out the said Princeton has been joined in the said suit, and that the said defendant has, to the best of deponent's knowledge, information, and belief, received no assistance whatever in the matter of said expenses in the conduct of the said suit from the government of the United States, or from the officer under whose superintendence the said Princeton was built, or from the contractors or manufacturers of the said machinery, or the naval constructors, who are all equally liable with him to a suit for the alleged infringement; but that the whole burden of the same has been thrown upon the said defendant, and has been sustained at his unaided individual expense; and further saith not.

F. A. HANFORD.

Sworn this 3d day of January, 1846, before me.

GEO. W. MORTON,
United States Commissioner.

SCHEDULE M.

[Executive Doc. No. 121, of the House of Representatives, 28th Congress, 1st session.]

Message from the President of the United States, transmitting the report of Capt. R. F. Stockton, relative to the vessel of war Princeton.

To the House of Representatives of the United States :

I transmit, herewith, the copy of a report made by Captain R. F. Stockton, of the United States navy, relative to the vessel-of-war the Princeton, which has been constructed under his supervision and direction, and recommend the same to the attentive consideration of Congress.

JOHN TYLER.

WASHINGTON, February 12, 1844.

U. S. SHIP PRINCETON,
Philadelphia, February 5, 1844.

SIR: The United States ship Princeton having received her armament on board, and being nearly ready for sea, I have the honor to transmit to you the following account of her equipment, &c.

The Princeton is a "full-rigged ship" of great speed and power, able to perform any service that can be expected from a ship of war. Constructed upon the most approved principles of naval architecture, she is believed to be at least equal to any ship of her class *with her sails*. She has, also, an auxiliary power of steam, and can make greater speed than any sea-going steamer, or other vessel, heretofore built. Her engines lie saug in the bottom of the vessel, out of reach of an enemy's shot, and do not at all interfere with the use of the sails, but can at any time be made auxiliary thereto. She shows no chimney, and makes no smoke; and there is nothing in her external appearance to indicate that she is propelled by steam.

The advantages of the Princeton over both sailing ships and steamers propelled in the usual way, are great and obvious. She can go in and out of port at pleasure, without regard to the force or direction of the wind or tide, or the thickness of the ice. She can ride safely with her anchors in the most open roadstead; and may lie to, in the severest gale of wind, with safety. She can not only save herself, but will be able to tow a squadron from the dangers of a lee-shore, using ordinarily the power of the wind, and reserving her fuel for emergencies. She can remain at sea the same length of time as other sailing ships. Making no noise, smoke, or agitation of the water, (and, if she chooses, showing no sail,) she can surprise an enemy. She can, at pleasure, take her own position and her own distance from an enemy. Her engines and water wheel being below the surface of the water, safe from an enemy's shot, she is in no danger of being disabled, even if her masts should be destroyed. She will not be at a daily expense for fuel, as other steam-ships are. The engines being seldom used, will probably outlast two such ships. These advantages make the Princeton, in my opinion, the cheapest, fastest, and most certain ship of war in the world. The equipments of this ship are of the plainest and most substantial kind—the furniture of the cabins being made of white pine boards, painted white, with mahogany chairs, tables, and sideboard, and an American manufactured oil-cloth on the floor. To economize room, and that the ship may be better ventilated, curtains of American manufactured linen are substituted for the usual and more cumbrous and expensive wooden bulk heads; by which arrangement the apartments of the men and officers may, in an instant, be thrown into one; and a degree of spaciousness and comfort is attained, unusual in a ship of her class. The Princeton is armed with two long two hundred and twenty five pounder wrought iron guns, and twelve forty-two pounder carronades; all of which may be used at once, on either side of the ship. She can, consequently, throw a greater weight of metal at one broadside than most frigates. The big guns of the Princeton can be fired with an effect terrific, and almost incredible, and with a certainty heretofore unknown. The extraordinary effects of the shot were proved by firing at a target which was made to represent a section of the two sides and deck of a seventy-four gun ship, and timbered, kneed, planked, and bolted in the same manner. This target was five hundred and sixty yards from the gun. With the smaller charges of powder, the shot passed through these immense masses of timber, (being fifty-seven inches thick,) tearing it away, and splintering it for several feet on each side, and covering the whole surface of the ground for a hundred feet square with fragments of wood and iron. The accuracy with which these guns throw their immense shot (which are three feet in circumference) may be judged by this—that six shot fired in succession, at the same elevation, struck the same horizontal plank in a target more than half a mile distant. By the application of the various arts to the purposes of war on board of the Princeton, it is believed that the art of gunnery for sea service has, for the first time, been reduced to something like mathematical certainty. The distance to which these guns can throw their shot at every necessary angle of elevation, has been ascertained by a series of careful experiments. The distance from the ship to any object is readily ascertained with an instrument on board, contrived for that purpose, by an observation which it requires but an instant to make, and by inspection without calculation. By self acting locks, the guns can be fired accurately at the necessary elevation,

no matter what the motion of the ship may be. It is confidently believed that this small ship will be able to battle with any vessel, however large, if she is not invincible against any foe. The improvements in the art of war, adopted on board the Princeton, may be productive of more important results than any thing that has occurred since the invention of gunpowder. The numerical force of other navies, so long boasted, may be set at naught. The ocean may again become neutral ground; and the rights of the smallest, as well as the greatest nation, may once more be respected.

All of which, for the honor and defence of every inch of our territory, is most respectfully submitted to the honorable Secretary of the Navy, for the information of the President and Congress of the United States, by

Your obedient and faithful servant;

R. F. STOCKTON,
Captain United States Navy.

HON. DAVID HENSHAW,
Secretary of the Navy.

Communication from the Navy Department.

[The foregoing documents being before the Committee on Naval Affairs of the House of Representatives, during the second session of the 28th Congress, a letter was addressed to the Secretary of the Navy by George P. Marsh, esq., of the committee, to which the Secretary returned the following reply. The reply of the Secretary, and the documents annexed to it, are marked schedules AA, BB, CC, and numbered 1 to 11, inclusive.]

AA.

NAVY DEPARTMENT, *February 12, 1845.*

SIR: I have had the honor to receive your communication of 21st January ult., asking information in relation to a claim before the Committee of Naval Affairs, in favor of John Ericsson, and, in compliance with your request, now have the honor to enclose a report from the Chief of the Bureau of Construction, &c., with copies of sundry letters referred to in that report.

These papers exhibit the extent of authority given by any officer, or by the department, to Capt. Stockton, so far as the records of the department and of the late board of navy commissioners show. It appears that the bills for labor and for materials, while the Princeton was being constructed, were paid on the certificate of Captain Stockton, and the approval of the commandant of the navy-yard at Philadelphia. The bills have been paid since the steamer was put in commission, on the certificate of the commanding officer. That when the claim of John Ericsson was presented to the department, neither the books of the department nor the Fourth Auditor's office affording any evidence of contract or employment of him in the construction of the Princeton, it was referred to Captain Stockton for explanation, and on his reply, a copy of which is communicated, the claim was disallowed by the department, because it did not appear to me that he had any claim which I could by law recognise or allow.

The information called for in your letter has rendered it necessary to examine very voluminous books and papers, which has produced a delay that I very much regret.

I have the honor to be your obedient servant,

J. Y. MASON.

Hon. GEO. P. MARSH,

Committee on Naval Affairs,

House of Representatives.

After the committee shall have used the report of the Chief of Bureau, with the accompanying papers, I will be obliged to you to return them to the department.

BB.

Letter of Captain Stockton referred to in the preceding communication AA.

PRINCETON, May 20, 1844.

SIR: In answer to your last communication of the 10th inst., on the subject of Captain Ericsson's accounts, a copy of which had been previously sent to me by the department, and which I could not approve, I have the honor further to state:

That it has given me great pleasure to acknowledge, upon all proper occasions, the services of Capt. Ericsson's mechanical skill in carrying out my well intended efforts for the benefit of the country. And, although I am still free to do so, yet my duty to the government, and not more than a proper regard for myself, require me to say, that I was quite surprised to learn that he had presented any *claim or demand whatever* against the department for services rendered to me in fitting the Princeton; nor was my surprise at all diminished on a perusal of his accounts, to find that he had been so extravagant in all his demands.

That the government may have a proper understanding of the true position of Captain Ericsson towards the government and myself, in regard to any demand he has made or may see fit to make for the services before alluded to, *however eminent and laborious they may turn out to be*—it seems to be proper here to state some of the circumstances connected with my first acquaintance with him, and his subsequent visit to the United States.

Previous to my acquaintance with Captain Ericsson, I had proposed to the President of the United States and the Navy Department to construct a steam-ship of war whose machinery should be entirely out of the reach of shot. Pursuing my inquiries on this subject a few years afterwards in England, I was informed by Mr. Francis B. Ogden, our consul at Liverpool, that a very ingenious mechanic by the name of Ericsson had been devoting much time and attention to the matter of submerged wheels. He afterwards introduced him to me; subsequently I had constructed in England, under his immediate superintendence, an iron boat with the submerged wheels, and which boat was afterwards sent to the United States. I also had constructed, under his direction, an engine similar to the one now on board the Princeton, which was also sent to the United States.

Having obtained these two models, I took my leave of Captain Ericsson, not knowing that I should ever again see him, and not supposing that his personal services would be ever required or desired by me. I had the fullest confidence that all that I wished could be done quite as well by the mechanics in the United States as by Captain Ericsson. I had no idea that Captain Ericsson intended to come to the United States, until I received a letter from him announcing his arrival in New York. I have invariably given him to understand in the most distinct manner, whenever the subject was alluded to, that I had no authority from the government to employ him; and that, if he received any thing, it must be altogether gratuitous on the part of the government; that, considering the great opportunity that he as an inventor would have to introduce his patents to the world by the aid of the funds of the government, I did not think it proper for him to make a charge for their application to the Princeton, in all of which he has concurred, as far as I know, up to the time of the presentment of his extraordinary bill.

It appears, then, in the first place, that Captain Ericsson came to the United States without my invitation or approbation, and, allow me further to add, much to my surprise and annoyance.

Having thus thrust himself upon me, and believing him at that time to be a mechanic of some skill, *I did not employ him, but I permitted him, as a particular act of favor and kindness*, to superintend the construction of the machinery of the Princeton, on the success of which he had placed so much of his future hopes and expectations. Captain Ericsson himself considered at the time he thus volunteered his services, that the opportunity afforded him to exhibit to the world the importance of his various patents would be a satisfactory remuneration for all his services in getting them up on so magnificent a scale.

In giving you this brief and general statement of my views on the subject of your letter of the 10th instant, I have endeavored to avoid every thing not directly connected with the subject of your inquiry.

Your obedient and faithful servant,

R. F. STOCKTON.

Hon. JOHN Y. MASON,
Secretary of the Navy.

CC.

BUREAU OF CONSTRUCTION, EQUIPMENT, AND REPAIR,
February 7, 1845.

SIR: In conformity with your instructions, communicated with the letter to you from the Hon. G. P. Marsh, of the Naval Committee of the House of Representatives, dated 21st January, 1845, requesting certain information relative to the construction and payment of bills for the United States steamer Princeton, I have the honor to enclose herewith copies or extracts of letters, which have been made from the books of the department of the late board of navy commissioners, and which it is believed comprise all the information those books contain respecting the nature and extent of the authority which was given to Captain Stockton or other persons, for the construction of that vessel. Of these letters,

No. 1, is from Captain Stockton to the Secretary of the Navy, dated 27th May, 1841.

No. 2, is from the Secretary of the Navy to Captain Stockton, dated 1st June, 1841.

No. 3, is from the Secretary of the Navy to Commodore Stewart, dated 1st June, 1841.

No. 4, is from the Secretary of the Navy to the president of the navy board, dated 11th September, 1841.

No. 5, is from the navy commissioners to Commodore Stewart, dated 21st September, 1841.

No. 6, is from the acting Secretary of the Navy to Captain Stockton, dated 22d September, 1841.

No. 7, is from Commodore Stewart to the navy commissioners, dated 5th October, 1841.

No. 8, is from the navy commissioners to Commodore Stewart, dated 18th November, 1841.

No. 9, is from the navy commissioners to Commodore Read, dated 7th April, 1842.

No. 10, is the first paragraph of an agreement for the engines of the Princeton, dated 14th January, 1842. This was transmitted to and signed by Merrick & Towne only, through the commandant of the yard at Philadelphia, in letter No. 9. The other provisions of the contract relate to the prices to be paid for the different details.

No. 11, is a copy of an engagement to furnish the boilers, the fittings of boilers, engines and blowers, smoke-pipe, and Ericsson's patent propeller.

None of the letter books show by whom these two engagements were made, or forwarded to the commissioner, nor any special authority for their being made or accepted.

By the contract ledger, it appears that the cost of the articles purchased under the above contracts or engagements was duly paid.

I have the honor to be, very respectfully, your obedient servant.

C. MORRIS.

Hon. JOHN Y. MASON, *Secretary of the Navy.*

No. 1.—COPY.

WASHINGTON, *May 27, 1841.*

SIR: I have the honor to transmit to the Navy Department a model for a steamship of war, which I will be glad further to explain by requisite drawings, if the department will order me to prepare them, and will order Lieutenant E. R. Thomson and William Hunt to Philadelphia, to assist me.

Your obedient and faithful servant,

R. F. STOCKTON.

Hon. G. E. BADGER, *Secretary of the Navy.*

No. 2.—COPY.

NAVY DEPARTMENT, *June 1, 1841.*

SIR: Your letter of the 17th ult., referring to the model of machinery for propelling a steam vessel upon a plan originally proposed to the department

by you, and stating your readiness to furnish draughts and further explanations of the same, has been received.

You will report to Commodore Stewart, at the navy yard, Philadelphia, for the purpose of preparing the draughts of such vessel, and such arrangements for propelling her as may enable the department to judge of the expediency of having one constructed in conformity to your wishes. When the draughts are completed, you will forward them to the board of navy commissioners, for the consideration and decision of the department.

To facilitate and expedite the preparation of these draughts, Lieutenants Hunt and Thomson will be ordered to report to Commodore Stewart, to assist you in the work.

I am, &c.

GEO. E. BADGER.

Capt. R. F. STOCKTON, *U. S. Navy, Princeton.*

No. 3.—COPY.

NAVY DEPARTMENT, *June 1, 1841.*

SIR: Captain R. F. Stockton has been ordered to report to you for the purpose of preparing draughts and explanations of a steamer and machinery for the consideration and decision of the department. Lieutenants Hunt and Thomson have also been ordered to report to you to assist Captain Stockton. You will please afford to Captain S. such facilities for performing this work as can be granted without injury to the service.

I am, respectfully, &c.

GEO. E. BADGER.

Com. CHARLES STEWART,

Commandant of navy yard, Philadelphia.

No. 4.—COPY.

NAVY DEPARTMENT, *September 11, 1841.*

SIR: The board of navy commissioners is directed to cause to be built two steam-vessels of war: one on Captain Stockton's plan, not exceeding six hundred tons, and one on that of Lieutenant Hunter, not to exceed three hundred tons.

I am very respectfully, your obedient servant,

GEO. E. BADGER.

Com. L. WARRINGTON, *President of the Navy Board.*

No. 5.—COPY.

BOARD OF NAVY COMMISSIONERS, *September 21, 1841.*

SIR: The Secretary of the Navy having determined to have a steamer of 600 tons built on the plan proposed by Captain Stockton, the commis-

sioners have determined to have her constructed at the yard under your command, and Captain Stockton will, it is understood, be ordered to report to you for this duty under your direction. The board have requested Captain Stockton to prepare and hand to you a draught of the plan of the steamer, confining her burden to 600 tons, but leaving her form and dimensions to his judgment. Steam is to be the main propelling power, upon Ericsson's plan. She is to be built of white oak instead of live oak, and her armament will consist of two heavy 8 inch guns and six 42 pound carronades. Captain Stockton has also been requested to prepare and forward to the board at an early day estimates of the cost of her hull, including her equipments. In preparing these and the draught called for, he may need the assistance of Mr. Lenthall, which, upon his asking for it, you will be pleased to allow. The board suppose that the most ready and efficacious mode of procuring the materials of wood will be by advertising for them in one or more of the Philadelphia papers, or by making generally known to timber-getters what may be wanted, and procuring them in proper quantities from one or more, as may be judged most expedient; they would be pleased to have your opinion as to the best mode of procuring the frame, &c., whether by contract or by open purchase in the market, exciting competition by making it known that such materials are wanted. Before closing any engagement of importance, which must be done through the navy agent, under your advice and direction, the board desire to be informed of all offers, with your opinion thereon; this will enable them to give definite and satisfactory directions upon the subject. The object is to provide all the materials necessary in the construction of the steamer as early as practicable, consistently with the public interests. Those of copper and iron will be furnished by the contractors upon requisition being made upon them. The board wish also to have your opinion on the subject of the steam engine; that is, where it would be most likely to be made to the best advantage.

L. WARRINGTON,

For the Board of N. Commissioners.

Com. CHARLES STEWART, *Philadelphia.*

No. 6.—COPY.

NAVY DEPARTMENT, *September 22, 1841.*

SIR: The department has directed the commissioners of the navy to cause a steam vessel of war to be built on your plan, not to exceed six hundred tons burden. You will superintend the building of said steamer, under the direction of the commandant of the navy yard at Philadelphia, making to him, from time to time, during the progress of the work, such suggestions as you may think proper.

I am respectfully, &c.,

J. D. SIMMS,

Acting Secretary of the Navy.

Capt. R. F. STOCKTON,
U. S. Navy, Princeton, N. J.

No. 7.—EXTRACT.

COMMANDANT'S OFFICE, U. S. NAVY YARD,
Philadelphia, October 5, 1841.

GENTLEMEN: I have received your letter of the 21st ultimo, in relation to a steamer of 600 tons, to be constructed at the yard, after the model suggested by, and under the direction of, Captain Robert F. Stockton.

All the facilities which can be furnished here for this object will be afforded to Capt. Stockton, whenever he is prepared to carry into effect the views of the department.

CHARLES STEWART.

To the BOARD OF NAVY COMMISSIONERS,
Washington, D. C.

No. 8.—COPY.

NAVY COMMISSIONERS' OFFICE, November 18, 1841.

SIR: You will be pleased to cause the necessary measures to be taken for procuring the timber necessary for the steamer, to be built on the plan of Captain Stockton, as stated in the commissioners' letter of the 21st September last. You will procure this timber through the navy agent, by contract, or open purchase, as you may deem best for the public interests, &c., to be got in conformity with the plans and specifications to be furnished by Capt. Stockton. The board wish particular and accurate accounts to be kept of the cost of this steamer, so that, when completed, a detailed report of cost may be made to this office, showing the quantities, &c., of the several materials used in her construction, and their cost respectively.

I am, &c.

L. WARRINGTON,

For the board of Navy Commissioners.

Com. CHARLES STEWART, Philadelphia.

No. 9.—COPY.

BOARD OF NAVY COMMISSIONERS, April 7, 1842.

SIR: Herewith you will receive copies of contracts made with Messrs. Merrick & Towne and James Cunningham, for engines and boilers, deliverable at the yard under your command, for the steamer Princeton, building under the instructions of Capt. R. F. Stockton.

L. WARRINGTON,

For the board of Navy Commissioners.

Com. G. C. READ, Philadelphia.

No. 10.—EXTRACT.

"The undersigned engage to build, for the United States government, a semi rotary steam engine on Ericsson's patent principle, and also to fix the

same on board a ship of war, according to the instructions, and agreeable to drawings to be furnished by Capt. Robt. F. Stockton, U. S. Navy. The workmanship of said engine to be of the very best description that can be produced in the United States, and the whole work to be performed to the annexed scale of prices."

Contract dated at Philadelphia, 14th Jan., 1842, and signed by
MERRICK & TOWNE.

No. 11.—Copy.

The undersigned engage to execute for the United States government the following work, agreeable to drawings to be furnished by Capt. Rob't F. Stockton, U. S. Navy; the quality of the work to be of the very best which can be produced in the United States, and the whole to be performed at the rate and price hereto annexed; the work to be delivered and put on board of a ship at the Philadelphia navy yard.

The marine boilers, each twenty-six feet long, seven feet wide, and nine feet high, and each to contain one thousand and one hundred and twenty square feet of internal or face surface, to be manufactured of the best Pennsylvania iron, well braced and stayed all over, and strong enough to carry a constant or working steam pressure of twenty-five pounds to the square inch; each boiler to be furnished with two neatly finished fire doors, of wrought or cast iron; two ash-pit doors, with frames of cast iron; one man-hole with permanent metallic joints; two mud doors and one set of fire bars—the substance of flues, as well as external casing, to be one quarter of an inch all over, excepting the termination of the flue in the middle or central boiler, the substance of which is to be three-eighths of an inch; the whole of which work, including three coats of paint on the boiler, to be performed for - - - - - \$15,000

2. Fittings of the boilers for each, to consist of the following, viz: One safety valve and seating of brass, with levers, &c., one stop valve, with copper spindle, front plate, and handle, all of brass, for shutting off the steam; one blow off cock, a slide with handle, stuffing box, &c., all of brass; stop-cock, or valve, for regulating the feed, with handle, &c., all of brass; two water gauges, with brass mounting, and three gauge cocks, with wash water pipe; also, a main steam pipe, of thirteen inches diameter, extending the whole of the front of the three boilers, to be made of copper three-sixteenths of an inch thick, and provided with sliding joints having glands and stuffing boxes of brass, provided, likewise, with suitable flanges, and duly attached to the boilers; also, a feed pipe of copper extending across the three boilers, provided with branch pipes and attached to the feed cocks; and also a copper pipe for carrying off the waste steam, to be connected to the three safety-valves, and provided with a short branch pipe in the centre; the whole to be performed for - - - - -

3,000

It is understood that the beforementioned prices include the cost of erecting the boilers on the manufacturer's premises, to attach the pipes and other mountings, and to raise steam, in order duly to test the soundness of the work, previous to shipping the

boiler, as well as the cost of erecting the said boilers, &c., on board of the ship at the navy yard in Philadelphia.

3. Two separate steam-engines with single cylinders, of twelve inch diameter, fourteen inches stroke, each to be provided with a centrifugal blower of four feet diameter, made of wrought iron. Each engine, with its blower, to be attached to a neat cast-iron framing, which also is to support the pulleys, including, also, a proper contrivance for tightening the leathern belts; all the bearings to be provided with capacious oil-cups of brass; also, an air receiver, or box, to be placed under the boilers for conducting the blast into the furnace of the boilers, to be made of sheet iron, and provided with dampers, or doors, with suitable handle and gear for regulating the blast; the whole to be made for - - \$4,000

4. Smoke-pipe, with sliding tube and machinery for lowering and raising the same; the machinery to be manufactured chiefly of brass, for - - - - - 1,250

5. One of Ericsson's patent propellers, to be of fourteen feet extreme diameter, and manufactured wholly of copper or composition metal, the spiral plates to be attached by screws, and so accurately fitted, and so perfectly alike, that they may be attached indiscriminately; the centre or hull to be accurately bored and provided with key grooves made to couple.

The propeller to be made complete, and two spare plates, duly fitted, to be included, for - - - - - 6,000

Total - - - - - \$29,250

It is understood that the above proposals do not include the cost of conveying and placing the boiler from on board the vessel in which they may arrive at Philadelphia, on board the ship.

JAMES CUNNINGHAM.

Witnesses:

CORNELIUS DELAMATER.

PETER HOGG.

[In consequence of the letter addressed by Captain Stockton to the Secretary of the Navy, under date of May 20, and hereinbefore printed, marked BB, and the communication of it to the Committee on Naval Affairs, Captain Ericsson thought it necessary to submit to their inspection the following letters, marked No. 12 to 27, inclusive.]

No. 12.

[Copy of letter from Captain Stockton to Captain Ericsson, not dated, but written and received in July, 1841.]

MY DEAR SIR: Mr. Thomson will hand you one thousand dollars on account.*

* This was in part payment of an interest purchased by Captain Stockton in a mathematical instrument invented by me.—J. E.

In making up the estimate for the cost of the ship, it will be necessary to consider what must be put down for the use of your patent right.

It will be necessary, therefore, for you to write me a letter, stating your views on that subject. As a great effort has been made to get a ship built for the experiment, I think you had better say to me in your letter that your charge will hereafter be (if the experiment should prove successful) — ; but, as this is the first trial on so large a scale, I am at liberty to use the patents, and, after the ship is tried, government may pay for their use in that ship whatever sum they may deem proper. Write to me in Philadelphia.

Your obedient servant,

R. F. STOCKTON.

Your letter will be sent to the commissioners.

[On receiving the foregoing letter from Captain Stockton, Captain Ericsson returned the following reply.]

No. 13.

NEW YORK, ASTOR HOUSE, *July 28, 1841.*

SIR: I have duly received your communication on the subject of my patent right for the ship propeller and semi-cylindrical steam engine; in reply to which, I beg to propose, that in case these inventions should be applied to your intended steam frigate, all considerations relating to my charge for patent right be *deferred* until after the completion and trial of the said patent propeller and steam machinery. Should their success be such as to induce government to continue the use of the patents for the navy, I submit that I am entitled to some remuneration; but, considering the liberality that thus enables me to have the utility of the patents tested on a very large scale, and the advantages which cannot fail to be derived in consequence, I beg to state, that whenever the efficiency of the intended machinery of your steam frigate shall have been duly tested, I shall be satisfied with whatever sum you may please to recommend, or the government see fit to pay for the patent right.

I am, sir, your most obedient servant,

JOHN ERICSSON.

Captain ROBERT F. STOCKTON.

No. 14.

PHILADELPHIA, *October 2, 1841.*

MY DEAR SIR: I will meet you at the depot at Princeton, on Tuesday morning, if you can make it convenient to dine with me on that day: you may return to New York in the night train. I have received orders to build a ship of six hundred tons; I have remonstrated against it. In the mean time I wish to converse with you on the subject.

R. F. S.

Captain ERICSSON, *Astor House, New York.*

No. 15.

PHILADELPHIA, *October 8, 1841.*

DEAR SIR: I wish you would make the drawings of a ship with the dimensions we spoke of. I will go to Washington as soon as you can send them to me. Put both bow and stern to her, and make her midship section according to the plan we spoke of at my house.

Yours,

R. F. STOCKTON.

Captain ERICSSON, *Astor House, New York.*

No. 16.

PRINCETON, *October 13.*

DEAR SIR: You need not send the drawings to me. I will be in New York soon, when I will see you, I hope. Make a drawing of the *amidship section with engine*, as well as the others; and the calculation for expense of engine and propeller complete.

Yours most truly,

R. F. STOCKTON.

No. 17.

PHILADELPHIA, *October 17, 1841.*

DEAR SIR: I have received orders to send on to the commissioners various calculations, cost of hull, equipment, &c., &c., &c., as well as for the engines. I cannot, therefore, visit New York as I expected, and will therefore give you, in this hasty manner, my wishes in regard to the drawings I wish you to make.

Length between perpendiculars	-	-	-	150 feet.
Beam moulded	-	-	-	30 "
Draught light forward	-	-	-	10 "
Do. do. aft	-	-	-	15 "
Do. load forward	-	-	-	16 "
Do. do. aft	-	-	-	17½ "

I want you to make the drawings to the precise draught of water, then calculate the displacement from the drawings: the difference between her light water and the load displacement will be her *true burden*. I have made her displacement light 700 tons, load 1400 tons. If I am correct, that will be near enough for her burden. Mark on the drawing the metacentre and the centre of gravity, and also the centre of floatation. I think you had better make five of midship sections alike, two abaft and two before ⊕. This will give us a large floor, and enable us to avoid any inflection in the lines. Let the ⊕ section be in the same place as in the old drawing. I have, I think, given you sufficient to enable you to complete the drawings; if not, write to me.

Please to make out the cost for engines entire, ready to set to work. You

are so much better skilled in these matters that you will have all ready by the time I get through my work, when I propose to take them all to Washington. Let me know when you are ready, and I will meet you at Princeton any day.

Yours truly,
Captain ERICSSON, *Astor House, New York.*

R. F. STOCKTON.

No. 18.

PHILADELPHIA, *November 21, 1841.*

DEAR SIR: Orders have been received here to go on with my steamship of six hundred tons. Therefore, the sooner we get the working drawings, the better the engines.

I will try to be in New York in the course of the week.

Yours truly,
R. F. STOCKTON.
Captain ERICSSON, *Astor House, New York.*

No. 19.

PHILADELPHIA, *June 2, 1842.*

DEAR SIR: Please to send me the tracing of the frigate which you have, and *mark on it the dimensions and place* for the main hatch. It must be convenient to take out the machinery in case of necessity, and at the same time as small as may be.

Yours,
R. F. STOCKTON.

P. S.—The bearer of this will call for your letter at any time you may name.

Captain ERICSSON, *Astor House, New York.*

No. 20.

PHILADELPHIA, *December 29, 1842.*

DEAR SIR: Enclosed I send you a note from Messrs. Merrick & Towne. How much room will we require along the shaft, and especially over the clutch? The constructor wishes us to take as little as will possibly answer. Say how much above, as well as on the sides and below.

I have been quite ill since I saw you last.

Yours truly,
R. F. STOCKTON.
Captain ERICSSON, *Astor House, New York.*

No. 21.

PHILADELPHIA, *February 3, 1843.*

MY DEAR SIR: The unfortunate death of my brother William will prevent my seeing you as soon as I expected. Have you got the drawings for the rudder and post ready?

Yours truly,

R. F. STOCKTON.

Captain ERICSSON.

No. 22.

PHILADELPHIA, *February 20, 1843.*

MY DEAR SIR: I am at my work again, after a tedious confinement, longer than I ever remember to have occurred to me. I am happy to inform you that all the timber for the Princeton has arrived, and we have as many men at work as can now be employed to advantage; and if none of the timber should be condemned, I hope before long she will make some *show*.

I will try to be in New York the last of the week or beginning of the next.

I hope the bands on the gun will be made to stand the 45 lbs. of powder. Won't Hogg insure them to stand?

Yours truly,

R. F. STOCKTON.

Captain ERICSSON, *Astor House, New York.*

No. 23.

PHILADELPHIA, *March 4, 1843.*

DEAR SIR: I am again disappointed in not getting to New York. Mr. Stevens has been confined to his room for some weeks, and it has been impossible for me to leave this place.

Can we place the boilers of the Princeton about three feet further aft? It will give us more room, and will, I think, leave space enough between the engines.

Yours,

R. F. STOCKTON.

Captain ERICSSON, *Astor House, New York.*

No. 24.

[Endorsed, Received 13th April, 1843.]

PHILADELPHIA, *Thursday.*

DEAR SIR: I send the tracings, by which you will be enabled to make the drawings for the wheel and gun carriages.

The after hatch going to the cabin will be 5 feet 6 inches wide. The chains, of course, will pass clear of that: we can pass the chains *through the beams*.

You will see that the carriage *one foot shorter* will work around the circle without difficulty. We have got the whole frame up, and I think will be ready to launch certainly in all June; I hope the middle of the month.

Yours,

R. F. STOCKTON.

Captain ERICSSON, *Astor House, New York*.

No. 25.

APRIL 20, 1843.

DEAR SIR: I have your letter. It appears to me that the gun carriage had better be altered at once.

Yours truly,

R. F. STOCKTON.

Captain ERICSSON, *Astor House, New York*.

No. 26.

PHILADELPHIA, *February 2, 1844*.

DEAR SIR: Will you send me a bill and receipt for the 1,150 dollars which I paid you for "services rendered in constructing and superintending machinery, &c., for the United States ship Princeton?" I will include it in the Princeton's expenses, and repay myself for the advance in that way *if I can*.

The ship performed well in the ice, the particulars of which I told Mr. Thomson to inform you.

Yours truly,

R. F. STOCKTON.

P. S.—If you have the amount of the bill paid for the *London engine*, and also the *freight and other expenses*, will you please to send me a bill receipted? I'll try to get that also. Do it as soon as you can, before a *new* Secretary gets in.

No. 27.

NEW YORK, *February 8, 1844*.

DEAR SIR: I have received your letter of the 2d instant. I am engaged, and have been for some time, in making out the bills for my services on the Princeton; but they range through such a length of time, and include such a multitude of items, that I have not yet been able to complete them.

Having no item of charge of the specific sum of \$1,150, it will be impos-

sible to separate the amount of your advance from the general bill. Had I not better give you credit in this bill for said advance, specifying the periods at which the various amounts were paid, viz: 1842, May 3, \$400; May 6, \$100, and July 23d, \$650. This will, I think, more clearly show the transaction. A fresh acknowledgment I suppose you do not require, as you already hold my receipts; and of course I will repay you the moment I receive payment from the department for my services.

On Mr. W. Thomson calling upon me the other day agreeable to your desire, I explained to him all about the model engine, and he kindly promised to convey my explanation to you. I hope you have ere this found Braithwaite & Milner's accounts; if not, I think Mr. T.'s suggestion to write for a duplicate account the only course, for I have not got a line by me touching the matter.

With regard to the distance instrument, the time is close at hand when the law requires that application should be made for a patent, or I shall forfeit the right to do it. I have a duplicate instrument ready; is there any objection to my lodging it with the specification and drawings in the Patent Office at once?

Dear sir, your most obedient servant,

J. ERICSSON.

Captain R. F. STOCKTON.

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